Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St., CHICAGO

H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary
H. D. FARGO, Jr., Vice-President and Advertising Manager
D. C. SORENSEN, Western Advertising Manager

Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 97
Number 6

CHICAGO, SATURDAY, AUGUST 10, 1929

Subscription — 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

Good Advice to Companies From Utility Commissioner

If we make a mistake, cheerfully acknowledge it and do our best to rectify the error, the chances are all in favor of the other fellow forgiving us and little harm being done. But if we make a mistake and stubbornly refuse to admit it, compelling him to make a hard fight to obtain his rights, that is where serious trouble begins—and usually keeps up. That leads to wars among nations, and in the case of public service companies spoils their public relations.

If the company has a quarrel with a customer it should adjust the matter personally and not wait for the complaint to get before the state utility commission. This policy was urged in a recent address by C. W. McDonnell, president of the North Dakota Railroad Commission, who pointed out that many complaints reach a regulatory board which should never have passed beyond the local office of the company.

This would cut down the work and reduce the importance of the commission, and prevent it from getting the credit for adjusting matters for the public, but Mr. McDonnell correctly thinks the general results are better if a fight can be avoided.

* * * *

He cited several instances of patrons' complaints as to service, over-charges and the like which the company could have settled, but, as the local manager did not clear them up, the cases went before the commission for settlement. There were hearings held and the commission adjusted the complaints, but not without leaving some sore spots.

Settlements of such matters are always possible, and the only question is: Who is to do it?

Had the company manager cleared up the trouble he would have received credit for it from the subscriber and a better feeling would have existed between company and patron. When inaction on the part of the company forces the commission to take a hand, the commission gets the credit for the adjustment, and usually the complainant feels rather antagonistic towards the company.

More and more utility companies are seeing the wisdom of adjusting such matters before they reach the commission, and the really useful commissions are glad to have disagreements between patrons and the utilities amicably settled without appeal to the regulation authorities.

Holding Companies.

Another bit of good advice given by Mr. McDonnell referred to utility holding companies, in which he said:

"The matter of holding companies, which may affect the rate question only indirectly, is an important one so far as the investing public is concerned. There are many of these companies, no doubt, performing a valuable service, but there are a great number which are purely speculative, rendering no real service whatever to the industry or the public; and, unless all signs fail, the holding company industry is due for a deflation in the very near future comparable with that experienced by the holders of Iowa and Illinois farm lands a few years ago.

"Just how this will affect legitimate operating companies or their customers it is hard to say. This problem is worthy of the most careful consideration by both the utilities and the regulatory bodies."

* * * *

The speaker was referring particularly to holding companies in the electric light and power field, but his comments can apply with equal force to syndicates forming mergers in other fields—including the telephone field. Holding companies described as "purely speculative" have paid high prices for properties for merging purposes, and men experienced in the business are expecting that there will necessarily be more or less deflation before long. When the short-time loans mature, readjustment of some kind will have to be made.

If, and when, deflation occurs, the conservative, solid holding organizations should not be injured in the public estimation. As President McDonnell says, many holding companies are performing a valuable service. Their plans contemplate participating in the operating end of giving public service permanently—not merely to grab a speculative profit and sell out—and the public should not classify them with the other type.

In all branches of the utility industry a

certain prejudice against the huge mergers is being fostered, and it would be most unfortunate and against public interest if the worthy organizations that honestly aim to serve the public were obliged to suffer along with those whose chief concern is to reap a quick financial profit and be on their way.

Improving Service.

The new owners of telephone properties, acquired to be added to a merged group of exchanges, would make a hit with their public if they paid more attention to improving the local service and convinced the people that their interests were being protected.

Too often the emphasis is laid on the fact that the new owners are planning to ask for higher rates, while little is said about making the service better. Of course, good service requires adequate rates, but the most ordinary shrewdness will induce the new management to talk *better service* as well as *higher rates.*

Comments in the press reflect the feeling that service requirements are often neglected by syndicate buyers. Here is a recent example from an Illinois newspaper, names being withheld:

"Persistent rumors substantiated by daily newspaper reports from the commerce commission advise that the local exchange has again changed hands and is now a part of the Blank Telephone Co., the Double-Blank Telephone Co., who recently bought it, having disposed of its interests.

"Local persons connected with the exchange know nothing of the transfer, but generally there is the expressed hope that it is true, and that the new company will make an effort to improve the service which is the cause of constant complaint from subscribers."

* * * *

Reading between the lines, the inference is plainly to be drawn from the paragraphs quoted that the first buyer of the exchange let the service go to seed and marked time until the property could be re-sold. According to the local editor, the public welcomed the second transfer in the hope that the new buyer would improve the service.

All of which means that those acquiring telephone plants would be in a better position if they devoted more effort to bracing up the service and proving to their patrons that their interests would not be neglected.

COMING CONVENTIONS.

United States Independent Telephone Association, Stevens Hotel, Chicago, October 22, 23, 24 and 25.

Independent Pioneer Telephone Association of United States, Stevens Hotel, Chicago, October 24.

Illinois Telephone Association, Springfield, Hotel Abraham Lincoln, November 20 and 21.

The advantages which locally-owned business enterprises—industrial as well as public service concerns—hold over absentee ownership are generally recognized. In this day of mergers and consolidations, however, it is surprising to find Big Business is paying more attention to cultivating the community spirit.

* * * *

The Melville Shoe Corp., operating a chain of shoe stores in more than 200 cities in the United States and selling eight million pairs a year, has laid out an elaborate program for its resident managers to follow in participating in the affairs of the communities where it operates.

This program includes joining and cooperating with the local business organizations, a training course in civic affairs for all store managers, a plan for the equitable handling of charity donations in these cities, and similar ideas to get away from the "absentee ownership" atmosphere which has a blighting effect on most commercial chains.

Underlying the general plan is the theory that if the chain managers do not become real citizens of the community, they cannot become successful merchants. This development is a notable tribute to the sterling worth of local ownership and should remind the locally-owned telephone company that it possesses an asset of considerable value—one that is worth keeping.

Prevention and Repair of Cable Trouble

Practical Hints Regarding Cable Maintenance Adapted Particularly for Small Exchange Men—Gathered From Study, Experience and Association With Experienced Cable Men—Third Award, Plant Division, TELEPHONY'S Contest

By Don Peltier,

Cable Splicer, Sullivan Telephone Co., Sullivan, Ind.

Regardless of the line of work a person may be in, there are always little "tricks of the trade" for him to learn Especially is this true of the man engaged in practical maintenance work in the small exchange.

At the present time, cable is being used more and more in this type of exchange and the prevention and care of cable trouble is becoming more and more an essential part of the maintenance man's work.

In this article on cable trouble, Mr. Peltier gives many practical hints, both on the installation of cable and the location of trouble, that the plant man in the small exchange will find most helpful.

Mr. Peltier is a practical cable splicer. He learned cable splicing and maintenance at Lima, Ohio, under Harry Burgoyne who is known to Ohio telephone men as "One of the best cable splicers in the country." Mr. Peltier did telephone work at Lima and cable work in many small towns of northwestern Ohio. About two years ago he moved to Indiana and is now working at Sullivan on a two-year program of underground and aerial construction.

Mr. Peltier knows the value of drawings to illustrate his points and we are sure that everyone interested in cable work will obtain many practical hints and information of value in his work from a careful study of this article and the illustrations.

All of us at some time or other know we could do some things better than we are told to do them. The man who works at the same trade, day in and day out, without learning anything new is doing neither his job nor himself justice. With this in mind, I am going to tell of a few of my ideas, and explain the use of some old ones that I know are good, which I have learned through study, experience and the association with others. Although

these ideas will apply to all of us, this article is written especially for the common majority of folks of a small exchange, who have to make things go by hard work and costly experience.

There are two main divisions in cable

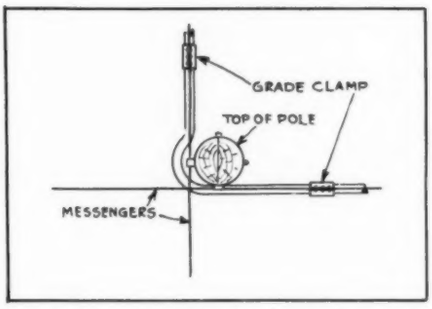


Fig. 1. Use of Grade Clamps on Corner to Hold Cable Both Ways.

maintenance—the prevention, and the repair of cable trouble.

Much cable trouble can be prevented if the right construction methods are used. Usually, when new cable construction is contemplated, an engineer is consulted as to the distribution of pairs, etc.

But after the plans are all laid out, it is left up to you to build the leads, string the messenger, and pull in the cable—of which I would especially speak.

Measuring and Pulling-in Cable.

While working at different exchanges I have repeatedly found cable measured and pulled in place with no allowance made for slack to take care of contraction and expansion of the cable, for turning corners, and ofttimes not enough for a standard splice.

A cable must have room to creep back and forth with the sway of the messenger and the pull of cold weather. A corner should be made as in Fig. 1, with grade clamps to hold it both ways to keep it from pulling tight against a pole. The end of a cable should be anchored with a grade clamp to keep it from creeping and pulling against the rings, Fig. 2. Branch

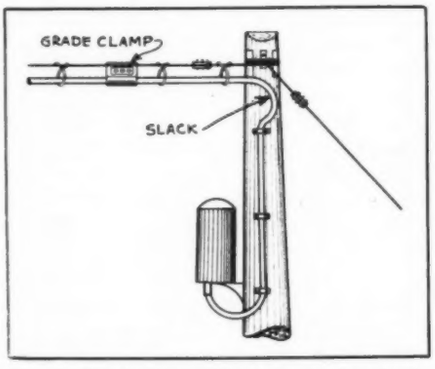


Fig. 2. Grade Clamp Used to Anchor Cable at End of Lead.

cables can be held in the same manner, Fig. 3.

Wherever a larger cable is spliced on to a smaller, Fig. 4, a good clamp to use, if you do not wish a commercial make, is constructed as indicated in Fig. 5. It is made from a sheet of lead sheathing drawn tight around the cable and messenger by a two or three-bolt clamp.

Other construction rules to follow are: Always place cable hangers on each side of the messenger hanger, as this keeps the cable from becoming ring-cut. It also balances the load and does not throw extra weight on one hanger. Never pull-in the

"The Man Who Works at the Same Trade, Day in and Day Out, Without Learning Anything New," Says Mr. Peltier, "Is Doing Neither His Job Nor Himself Justice." So He Tells Some of The Things Regarding Cable Work He Has Learned Through Study, Experience and Contact with Other Cable Men.

cable and leave ends for a splice any closer than three feet from a pole, for the sway of the span soon breaks the lead at the wiped joints.

Rings should be placed close enough together so that the weight of the cable will not buckle in between and cause ring-cut. Of course, we all know that the

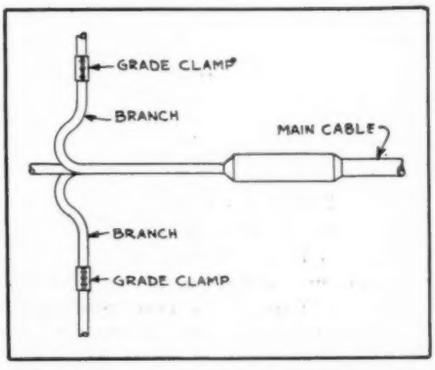


Fig. 3. Use of Grade Clamps to Hold Branch Cable.

tighter a messenger is, the less wear will there be on a cable at the poles.

Right here while we are building our lead is a good time to figure on our cable bonding, at least between cable and messenger. It makes no difference what kind of cable hangers you use, so long as they are metal, sooner or later they are going to rust and cause a poor contact between messenger and cable, and if lightning or anything "hot" gets on the messenger, the arc between the rusted ring and cable will

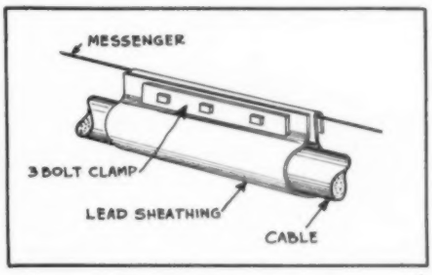


Fig. 5. Detail of Clamp Made from Lead Sheathing.

melt a hole in the sheath; if it has a good path, this is not so apt to happen.

A bond constructed of a heavy gauge copper wire, looped to allow contraction and expansion of cable, if soldered to cable and messenger, Fig. 6, and placed at the end of the cable and every eight or ten spans along its length, should be sufficient for this purpose of providing a good electrical path between sheath and messenger.

After we have our cable all up and spliced, it should not be neglected, for a lot of cable trouble can be avoided by regularity in patroling cable systems. This should be done at least every three years, if not yearly.

In this patrol, some things to look for are: Slipped hangers, slack light drops on cable, bad corners, limbs of trees rubbing cable, broken bonds. Where the cable has been up quite a few years, it should be inspected at the poles for cracks, etc.; also look for bad terminal conditions, such as rusted top coverings, terminal cables loose or hanging, cracks in terminal cable. If a protected terminal is used, see if the ground is in good shape. There are many other things that can be added to this list depending on individual plants.

But when we do have trouble in our cables, we want to know how to locate it

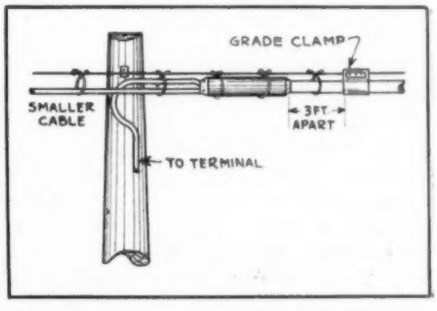
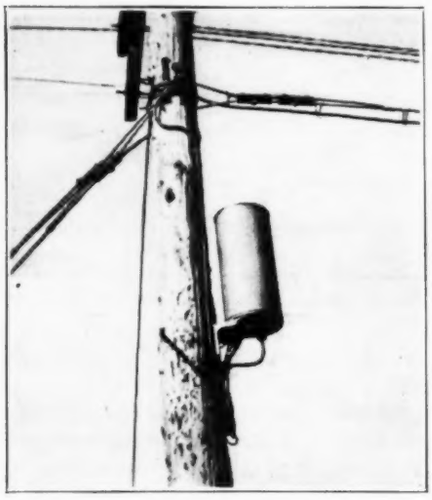


Fig. 4. Clamp on Main Cable When Smaller Cable Is Spliced to It.

quickly, as trouble holds up service. Here are a few ideas that have worked for me on trouble-shooting:

Magneto cable will be very wet before trouble becomes serious; whereas, a few volts will cause havoc in a common bat-

tery system. All magneto trouble can be located usually with the common fault-finder or wireless. But in the common battery system, it is difficult for the inexperienced to locate all faults: first,



The Use of a Clamp on the End of a Cable and Slack Left at Terminal.

because the right hook-up with the machine is not made; second, low voltage trouble dries off when a machine is used: third and most common mistake, the machine's change in tone cannot be distinguished.

A few pointers on the first of these three are: Get a good "set up" on your trouble, as cablemen express it. When you have more than one pair bad in a cable, a cross is the best to locate on; it very seldom fools you. A ground is good, when you are sure it is to the sheath, like lightning burns, etc., but a ground is uncertain, because it is usually caused by being in contact with the grounded side of another pair.

The thing to do is to find the other pair, and locate it as a cross. A short is good to locate on if you have good ears—and right here is where a change in tone may fool you. If you are locating on a short, running along on the outside layer and it suddenly jumps to an inside layer at a splice, the tone changes considerably, and if a person is not careful it may lead you to suspect the trouble is in the sleeve.

When it comes to the second of the three reasons mentioned, I have found that in nine cases out of ten, trouble caused by moisture is so slight, that the ordinary troubleman is unable to locate the fault due to its drying out or to the faintness of the sound, when using the ordinary exploring coil. Of course, an expert bridge man can offset these difficulties to a great extent, but in a small exchange, an expert bridge man is not usually on hand, and this class of trouble must be found by the process of elimination and by hard work.

To overcome these difficulties to some extent, I have constructed a machine which I have used with a great deal of satisfaction. First, in case an ordinary wireless set is not regular equipment at your exchange, a tone constructed as shown in Fig. 7 is a fair substitute if used with an amplifier constructed as shown in Figs. 8 and 9; otherwise, the tone will not work.

The tone consists of a buzzer and a dry cell in series with the primary side of an induction coil, Fig. 7-B. A switch should be used to open and close this circuit. The secondary winding of the coil goes to the line. It can be housed in an old bell box 5 ins. by 6½ ins. by 8 ins., Fig. 7-A.

The amplifier consists of the following: A 5 to 1 ratio transformer is used with a W. X. 12 tube, one dry cell and a small 22½ volt B battery, as used with portable radio sets. A six-ohm rheostat is placed in series with the positive side of the filament circuit to control the tube, or the volume. The whole amplifier is then installed in a small box 5 ins. by 7 ins. by 10 ins.

Using the Amplifier Set to Locate Trouble.

A shoulder strap and waist strap, adjustable with buckles to make it fit firmly on the operator's back when climbing poles, is fastened to the box, Fig. 9. A standard 30,000-ohm radio receiver connected to the output of the machine, with the regular exploring coil going to the input posts, constitutes the whole of the equipment. The cost will not exceed $5 with what parts that can be found around most exchanges.

The amplifying kit is used like the regular exploring coil, on all classes of trouble. Its advantage over the regular coil, as proved by experiments performed with it is that more low voltage faults can be found with less difficulty. Its excellence in use with the commercial machines cannot be beat when locating a short in the center core of a large cable, or where street traffic, or high wind make it difficult to hear the sound, for the close-fitting receivers, covering both ears, tend to shut out outside sounds and make it easier to hear the amplified signal clearly.

In this article I have not mentioned underground cable, because there is very little underground cable used at most small exchanges, and the cable that is underground is usually of a small unit, so that trouble can be located about the same as aerial faults. In speaking of underground cable, do not confuse the so-called buried cable with the regular constructed

Grade Clamp Ahead of Splice Where Smaller Cables Join Larger; Arrow Points to Clamp.

tile or fiber duct used with the other.

Buried cable is in a class of its own when it comes to trouble. Ask any cableman what he thinks of it. There is only one real way of effectively locating trouble in buried cable, and that is by bridge measurements, or else a strong back and stout shovel.

There are my own ideas. Your ideas are perhaps just as good or better. As for myself, I like to hear of the other fellow's trials and how he overcomes them, especially those "Old Timers" who had to fight things out for themselves. So, if you will overlook the things that you disagree with, and read that which you can use to make your job easier, this little talk will have done its bit.

Berliner, Inventor of Microphone Transmitter, Dies in 79th Year.

Emile Berliner, the famous inventor, whose disk phonograph record is used in millions of homes throughout the world, and whose microphone made radio broadcasting possible, died at his home in Washington, D. C., on August 3 in his 79th

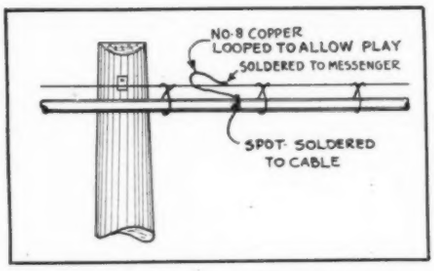


Fig. 6. Bond Between Cable and Messenger.

year. He was stricken with apoplexy a week previous but had rallied slightly.

Mr. Berliner followed various vocations before fortune rewarded him. He sold glue, painted backgrounds on enlarged photographs and traveled as a salesman for a Milwaukee wholesale house from 1870, when he came from Germany, until he settled in Washington in 1877 to begin experimenting.

During his leisure time he had studied electricity and acoustics. While a clerk in a Washington store he experimented after hours and evolved the idea of the loose-contact transmitter, or microphone, which placed the telephone on an advanced commercial basis some three years after Bell and Watson had discovered the principle of the electric telephone in Boston. Later the microphone was to become also the soul of radio broadcasting.

In telephone history Berliner is credited with discovering the microphonic principle —loose contact with variable pressure, which enabled the electric current to transmit the undulation of the voice into electric undulations. His invention was purchased by the Bell company in 1878 and he was employed by it, commencing as a general utility man in New York in November, 1878.

In January, 1879, he was sent to Boston

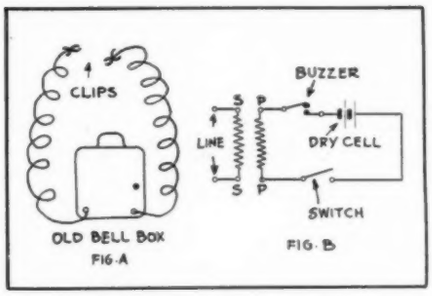


Fig. 7. Details of Tone for Testing Purposes.

to experiment with Blake's transmitter in an effort to remedy the talking adjustment. When Berliner took hold of the work "it was not possible to make 12 transmitters alike good, and when these were adjusted at night they were out of adjustment the next morning." Six weeks of work by Berliner remedied the difficulty so that 200 transmitters could be made up in a day, and once adjusted stay in first class working order.

In 1887 he achieved the second scientific discovery that placed his name in the forefront of inventors by giving the world the gramophone. This talking machine utilized the disk record, also his invention, and a horizontal wave groove, rather than the vertical groove on a cylinder. He invented and perfected, as well, the present method of duplicating disk records.

His inventive genius also turned to aeronautics. Before the Wright brothers conducted their first successful flying experiment on North Carolina dunes he was at work on the helicopter. He contended that this type of aircraft possessed superiority over that requiring a running start to get into the air, because it would conserve space and permit of ascent from a city square. This research he turned over in 1919 to his son, Henry, after the latter had designed and flown to a great height a helicopter.

Born at Hanover, Germany, on May 20, 1851, Mr. Berliner was graduated from Samson School at Wolfenbuttel in 1865 and came to this country five years later. Friends of his father gave him his start in Washington.

The older Independent telephone men

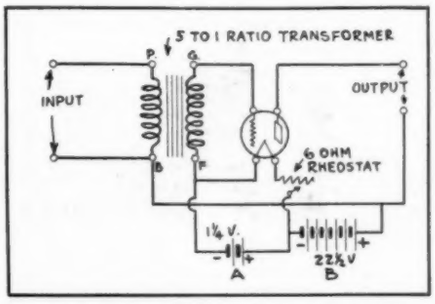


Fig. 8. Details of Amplifier Used with Tone.

will remember the famous Berliner patent suit which was finally decided on January 16, 1903, after years of litigation.

If the Berliner patent could have been enforced, the Bell patent monopoly would have been continued until 1908 instead of January, 1894, at which time the second of Bell's original patents expired.

Berliner had filed his application for a patent covering the microphone on June 4, 1877, but the patent was not issued until November 17, 1891. As a result of this long period between the filing and the issuing of the patent, the Bell company, which had purchased the Berliner patent in 1878, was accused of having connived to keep the Berliner patent pending in the patent office for 14 years.

The Berliner patent was attacked on the grounds of invalidity by Milo G. Kellogg and a brief was presented to the United States attorney general in 1892. In 1893 the attorney general, in the name of the United States, brought suit against the American Bell Telephone Co. Judge Carpenter in circuit court in Boston, Mass., on January 3, 1895, declared the Berliner patent invalid for two reasons, but he did not pass on other questions brought up.

The first reason assigned was that fraud was used in obtaining patents, and second, that a patent had been granted in 1880 to

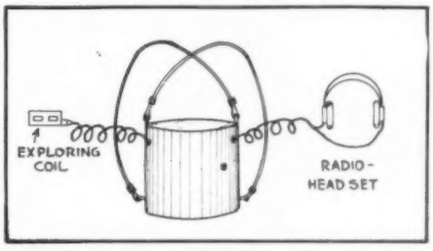


Fig. 9. The Amplifier Ready for Service with Tone.

Berliner on the same invention. On a final appeal the United States Supreme Court on May 10, 1897, held that no fraud had been proved. Therefore, the patent could not be ordered cancelled.

The first decision, however, had brought about disregard of the Berliner patent, and the American Bell Telephone Co. brought suits in equity against two Independent manufacturers, asking for injunctions restraining the defendants from using carbon transmitters. Judge Arthur L. Brown of the United States District Court of Massachusetts on February 27, 1901, decided that "At the date of the application, June 4, 1877, Berliner had not made the invention covered by the patent issued to the American Bell Telephone Co. on November 17, 1891."

Judge Brown held the Berliner patent invalid because "The invention described in the patent is radically different from the patent described in the application; because the invention was previously patented by Berliner; because Edison was the prior inventor." This decision was appealed and on January 16, 1903, the United States Circuit Court of Appeals affirmed Judge Brown's decision on the ground of non-infringement. The outcome of these suits ended the attempt of the Bell company to enforce the patent.

Operators' Transmitters and Receivers

Evolution of Bell Operators' Telephone Transmitters and Receivers From First Hand Telephone Instrument Used in 1878 to Set Used Today—Differentiations Made in Physical Form to Facilitate Work of Operators in Handling Calls

By H. I. Beardsley,
Apparatus Development Department, Bell Telephone Laboratories

With the institution of the first telephone central office there arose a need for transmitters and receivers which were suitably arranged for operators' use. The requirements for these instruments in central office service were so different from those of use at the homes and offices of subscribers that instruments for the two types of service necessarily were developed along separate lines.

The development of operators' instruments has profited by the fundamental studies made upon instruments in general, but at the same time has involved differentiations in physical form to facilitate the work of the operators in handling subscribers' calls.

Earliest Forms of Operators' Transmitters and Receivers: Fig. 1. Bell's Hand Telephone in Use as a Transmitter. The Same Instrument Acts as a Receiver With Incoming Voice-Currents.—Fig. 2. Transmitter and Receiver Were Mounted at Opposite Ends of a Bar Magnet in This Operator's Handset of 1870.—Fig. 3. An Early Blake Transmitter and Associated Receiver, Mounted to Leave One of the Operator's Hand Free.——Fig. 4. Instruments the Same as Those of Fig. 3, Supported in a "Gilliland Harness" to Free Both Hands.—Fig. 5. Another Mounting Arrangement Keeping Both Hands Free.

Succeeding the original "butter stamp" hand telephone the instrument, used by the operators in 1878, was a device serving both as a transmitter and receiver. In appearance slightly resembling a desk stand receiver of today, it is shown in use in Fig. 1.

Developed by Bell and known therefore as Bell's hand telephone, it was a single-pole, permanent magnet instrument. The magnet was a straight bar mounted at right angles to the diaphragm, and bore a coil placed around a soft-iron extension at the end. The earliest of these instruments were enclosed in cases of wood.

When one was used as a transmitter, sound waves impinging upon the diaphragm caused it to vibrate and so varied the magnetic field, inducing in the coil varying currents which were electric counterparts of the sound waves. When this instrument was used as a receiver the incoming voice current, by its variations, changed the magnetic field of the coil through which it flowed, thereby vibrating the diaphragm and producing a close approximation to the original sounds. The following year, 1879, there came the instrument shown in Fig. 2. The transmitter and receiver units were separate, but were arranged to be held in one hand. The transmitter, of the type developed by Edison, was changed in function. It no longer generated the voice-current, but by changing its resistance in response to the sound waves it varied the current supplied by a battery.

A toothed metal ring in contact with the back of the diaphragm pressed against the front electrode, a hard carbon disk. By that construction, pressure of the disk against the back electrode, a disk of soft carbon was varied,

and the current was changed correspondingly.

The receiver operated on the same principle as the older instrument and was made up of equivalent parts. Instead of being at right angles to the diaphragm, however, the bar magnet formed the handle on which the transmitter and receiver were mounted.

That same year there was introduced the operator's set of Fig. 3, with the transmitter and receiver entirely separate. The transmitter derived its name from Francis Blake, Jr., who carried out the original development on which it was based. Its operation was by variation in resistance at the contact between the disk of hard carbon and a metal ball supported against the back of the diaphragm by a light spring.

A heavier flat spring supporting the disk kept it pressed against the ball, so that vibrations of the diaphragm produced pressure differences at the contact area. To secure the proper range of pressures, adjustment was provided by supporting the spring upon a hinge-like member whose position was controlled by a screw.

The transmitter was enclosed in a wooden box having an opening in front of the diaphragm, and was supported before the operator by a vertical rod. The receiver, held in the operator's hand during use, was unchanged in principle, but resembled in appearance the desk stand receivers with externals binding-posts; the case was of hard rubber.

The next year the same instruments were mounted in a structure which freed both the operator's hands. This was the "Gilliland Harness" of Fig. 4, an adjustable framework resting on her shoulders and strapped around her waist, supporting the transmitter a short distance in front of her mouth and the receiver at her ear.

On account of its weight, almost 6½ pounds when fitted with instruments, this structure was not put into general use.

Fig. 5 shows another mounting arrangement brought out that same year, which held the transmitter at a convenient position by a vertical rod, and by a horizontal bracket held the receiver near the operator's ear. Though requiring that she hold her head in a particular position for speaking or listening, it was a noteworthy advance over the harness from the standpoint of comfort.

An important change in design was embodied in operators' transmitter produced in 1888. In accordance with a somewhat earlier development, both electrodes were of carbon and the space between was filled with carbon granules. Change in resistance with vibration of the diaphragm came from variations in pressure at the large number of contact surfaces between the granules, rather than at a single contact surface as before.

In 1890 came the "solid back" design of Anthony C. White, not incorporated in operators' instruments, however, until the following year. The rear electrode was no longer mounted on a spring, but was attached rigidly through a small intermediate part to the back of the case, and the front electrode was held by a metal stud which passed through and clamped the center of the diaphragm.

In 1891 a similar transmitter was made a part of the set shown in Fig. 6. It is of interest to note that the mouthpiece used resembles that of today's desk stands in size and shape.

The receiver used was designed in 1884 by W. L. Richards, now consulting historian of the Bell Laboratories. It was one of the earliest of the thin or watch-case type, suitable for use with a headband. Essential parts corresponded to those of previous designs of receivers, but compactness was secured by placing the bar magnet on the outside of the receiver case to form the bracket by which the headband was attached to the case.

An extension, consisting of a soft-iron core at right angles to the end of the magnet, ran through the center of the coil inside the case. Small screws near the middle of the bar magnet fastened the receiver to a headband sufficiently large in area to distribute the weight well over the operator's head.

Another adaptation of an independently supported transmitter and headband receiver, that of Fig. 7, was put into use

Stages in Development of Bell Operators' Headsets: Fig. 6. A White Transmitter and a Richards Receiver Mounted on a Headband. The Set Was Brought Out in 1891.—Fig. 7. Another Supported Transmitter, Used With a Completely Enclosed Receiver. Compactness of the Receiver Was Obtained by Use of a Spiral Magnet.—Fig. 8. In This Set the Transmitter Is Essentially the Same as Those of Today, and the Receiver Is of Bipolar Type, With a Horseshoe Magnet. —Fig. 9. Today's Set, With Receiver Held by a Swivel Yoke to a Wire Headband.

about the same time. The transmitter was the same in internal structure as that just described, but was supported by a bracket extending from the switchboard. Though still of single-pole construction, the receiver was made more compact by the use of a laminated, curved magnet of the so-called spiral type, enclosed within the case. Attachment to the headband was by a thumb nut.

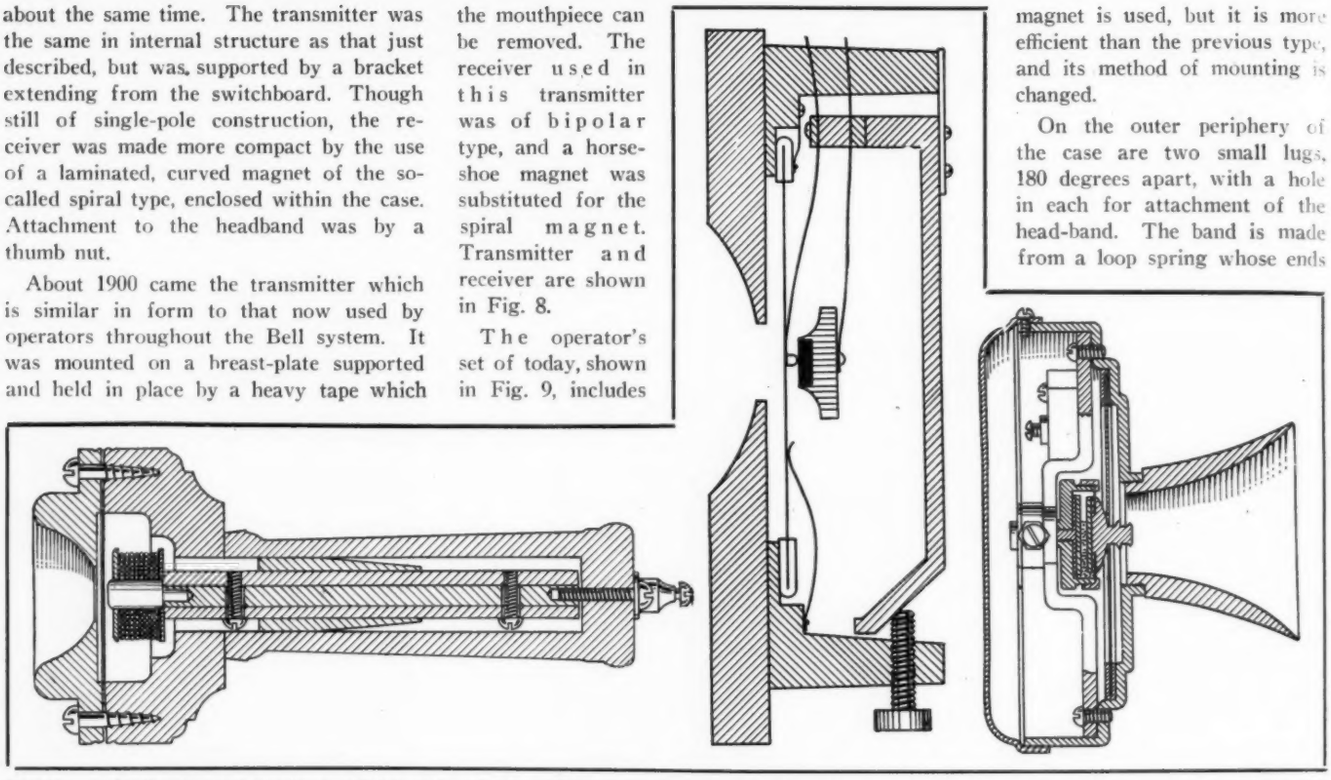
About 1900 came the transmitter which is similar in form to that now used by operators throughout the Bell system. It was mounted on a breast-plate supported and held in place by a heavy tape which extended around the neck of the operator.

Adjustment of the tape and movement of the mouthpiece in its ball and socket mounting bring the opening directly in front of the operator's mouth, and cleaning is faciliated by the ease with which the mouthpiece can be removed. The receiver used in this transmitter was of bipolar type, and a horseshoe magnet was substituted for the spiral magnet. Transmitter and receiver are shown in Fig. 8.

The operator's set of today, shown in Fig. 9, includes a transmitter similar in form to that just described, but incorporating certain important changes, such as an improved carbon button, which make for better, more efficient operation.

A bipolar receiver with a horseshoe magnet is used, but it is more efficient than the previous type, and its method of mounting is changed.

On the outer periphery of the case are two small lugs, 180 degrees apart, with a hole in each for attachment of the head-band. The band is made from a loop spring whose ends are clamped in a bracket; to the bracket is attached a swivel yoke with points for engaging the lugs. By the rotation and the free movement introduced, closer fitting to the ears is secured and extraneous noises are thereby excluded from it.



Section of Bell's Hand Telephone Which Was Used as Both Transmitter and Receiver. In Blake's Transmitter a Carbon Disk Was Pressed by a Flat Spring Against a Contact Point Touching the Diaphragm. The Carbon Granules of the White Solid Back Transmitter Separating the Two Carbon Disks, Gave a Large Number of Contact Surfaces for Variation in Resistance.

Operator Tells of Work in Hawaii

Private Branch Exchange Operator at Honolulu Gives Some Very Interesting Sidelights on Traffic Work in Hawaii in a Letter to Mrs. Dorothy H. Van Ert, General Traffic Supervisor of Illinois Telephone Association at Springfield

Here is a quaint charming letter from the land of moonlight and ukeleles, moonflowers and hula dancers. It ought, if you haven't entirely forgotten the way back to Peter Pan and the Never Never days, to make you fairly see the snow-capped waves break on the beach of Waikaikai; to hear the strum of the steel guitars, and the low strains of Aloha.

It holds still another message for American telephone girls though, a message of cooperation; a message which says that no matter where we may live, whatever our name or our race may be, our work has indeed made us "sisters over the wires." Wherever you find telephones and telephone service and telephone girls, you will find the same eager willingness to serve and the same high ideals of service.

DOROTHY H. VAN ERT.
Honolulu, Hawaii.

Dear Mrs. Van Ert:

It is evident that we have a common interest, and that is telephone work, concentrating on that branch of traffic—telephone operating. I was formerly a member of the Mutual Telephone Co. of Honolulu, an operator in its main traffic office for a number of years until I took over the private exchange where I am at the present time employed.

Anything in telephone work has been of personal interest to me, and it is a regret that such an interest is not general from a technical point of view. It is mainly due to the individual operators themselves and the fact that the population out here is predominately a racial mixture. But it does not erase the fact that we all work for a common cause, and that is to promote service.

Somehow when there is something definitely in common with and between two humans, all creeds and racial discrepancies seem to evaporate, leaving to the two minds the beauty of thought that somewhere, somehow, mutual exchange of ideas does satiate desire for education and progressiveness. Even our civilization, ancient and modern, has refused to be at a standstill. Taking that as a basic idea, industry has advanced tremendously, even the long jump down to the individual human being himself.

To the progressive individual possessing an average intellect, the initiative to make himself or herself, whichever the case might be, a little better today than yesterday, is a natural prerogative. To these high ideals and principles I've attached my star, and underlying all this is the fact that I do take my work very seriously.

The concluding thought that I want to express here is that my motive is above all self-betterment.

It is only natural that you are desirous of knowing something of our telephone work out here and I shall endeavor to tell you as much about it as I can, interspersed

with highlights and clouds. Let us begin with the private exchanges, for that is the sphere in which I work every day.

All the P. B. X. exchanges here are rented by private corporations and business houses from the Mutual Telephone Co. which in turn controls the whole of the telephone system. The "Company" itself is private, but it comes under the head of the public utilities board of direction thta must sanction all rates for the public subscriber.

The telephone system in Honolulu is Strowger automatic, with no party lines. With the exception of those exchanges which operate a one-position board, the majority of the big houses have the two positions with two operators in charge. I have a two-position, three-key system. The first is answering or dialing, second to wait, third to ring. The one-position boards have the two-key system: first key to answer, dial, and ring.

With the small exception of about six operators doing duty on the P. B. X. positions, the rest have not what I term really "apprenticed." The result is faulty service due to hackneyed, ill-assorted phrases, and failure to cooperate. The general run of operators in this particular branch of "the service" is the fact that they are left too much to themselves, giving them a high opinion of their own importance and independence. Unerringly you can see that there is a division between those operators who have served time and those who haven't. *We* stick together.

All private exchange operators are attached to their immediate business houses as a permanent fixture in their employment. Relief operators are rented from the "Company" service, charged by the hour.

All calls and service via P.B.X. receive the attention of the operator when on duty. Otherwise a subscriber wanting service at odd moments must consult the directory for the number of the department wanted. He rings his number automatically and receives an answer if someone is there.

If this party calls his department number when the operator is off duty, dialing the right number but the particular line happens to be occupied, there is no busy report, and he automatically fails on the next available clear trunk and, incidentally, the wrong department. One would think the subscriber would be ill-tempered with all that waste of time, but it is something he has to put up with—there is no alternative, so be gracious about it.

Some exchanges (private) maintain service throughout the day. It is strange sometimes to think that from 8 o'clock in the morning right up to 12 o'clock, there is a constant hum, and then all of a sudden a quietness until business starts again at one o'clock.

Service for long distance must go through the hands of a Mutual Telephone Co. operator before such calls are completed. For such services rendered a particular charge for that locality is made.

Somehow now, it comes back to me that it is a real pity that the majority of the girls refuse the idea of having a supervisor. At one time the telephone people did send one out to help the girls on the outside. The thing fell through, due to the fact that the supervisor herself didn't apply herself the way she should have. It is a regret in a bigger way than I put it, because the girls could have had one wonderful friend and confidante. The result of this lack of supervision today is so acute that it is only we, who look ahead for tomorrow and other tomorrows, who suffer from the ignorance of a few. It is literally true that one bad apple rots a whole bushel. The parallel is there.

A little geography of my particular island to make my description solid as to conditions, to the whys and wherefores! In order to appreciate the seeming flaws in the work here, the position of this island Oahu, the principal one of the whole group of eight, must be taken into consideration, as in every other country. Considering her physical and natural resources and being in the path of yearly severe winds and storms and the potpourri of a gigantic racial mixture, it is widely and generally understood that our telephone system out here is modern and far advanced in every respect. Naturally with a small and confined area to work in, it must be so arranged that the results coincide with specific development. The other islands operate the old Bell system with party lines.

It has only been quite recently that we have been able to get such a unique system and service out here. Each of us has the other to thank "for value received" and the big monopolies out here have their "Sugar Daddy."

Every-day life, as it is to the average American who have ever been in Hawaii, is a lackadaisical existence out here in the islands, filled only with the perfume of flowers and music and a lot of romantic slush and nothings. With education so compulsory, and progress advancing so rapidly, everyone of us must follow or be left behind. The romantic side of life out in Hawaii still persists. It will always remain a heritage. The climate in general is suitable, with no extremes. It is lovely to the nth degree, and I say that not because I am an island product.

THE STORY OF A TALL, TALL PINE

By Miss Anne Barnes

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

On a beautiful hillside slope once stood a young pine sapling straight and strong. The sun and warm breezes gave it life-growing qualities. Daily breezes exercised it; and the high winds early taught it resistance to sudden storms.

As one season followed another it rooted itself more firmly into the earth in order to support its constantly-growing height and breadth. And in the fullness of time it became a tree.

One can fancy this young sapling looking up yearningly to the great old trees all about it, longing for the time to come when its topmost branches would mingle with theirs. What lessons it must have learned from those sturdy old trees, its ancestors.

When heavy wind storms swooped down, these great old trees bent creakingly forward and back. And the young sapling quickly followed their example.

Very likely the old trees whispered to the young sapling as they swayed forward, "Bend rather than resist and break. Bending tests your strength and it is good exercise."

It took 25 years of such growing before its topmost branches mingled with those of the time-scarred old trees, its ancestors.

Then one day man looked on this young tree and it looked good to him; so he marked it for one of the greatest service to mankind. And its ancestors murmured proudly, "Young tree, your beauty and strength and perfection have singled you out for a great service. We are proud of you this day, for many of your kind have been looked on, but few have been chosen."

"I know now why our ancestors urged us to grow tall and straight toward the patch of sky above us. It took 45 feet of growing in all kinds of weather, but those were happy days of preparation; and what a super-service we are now qualified to render.

"Sentinels by day and night we stand, tall and sure, guardians of man's communications."

MORAL: "It takes a heap of livin'" to make a super-telephone pole; also to become a competent telephone man or woman.

Here and There in Telephone Work

The Magneto Exchange Repairman—Transmitting Trouble.

By John A. Bracken.

The transmitter of the magneto telephone set is the device into which a person talks and from which speech is transmitted by means of electric currents. These are varied in strength by the vibration of the transmitter diaphragm in correspondence with the original speech sounds, thereby causing the reproduction of the sound at the receiving end of the circuit to which the telephone is connected. The quality of the speech transmission is dependent upon several things, among which is the kind of transmitter used and its mechanical condition.

Transmitters are, as a rule, less liable to get out of order than are receivers. However, the most frequent source of trouble in transmitters is packing of the carbon granules, and a scratching or frying sound. By "packing" it is meant that the carbon granules stick together and form a solid mass, thus short-circuiting the transmitter and making it inoperative.

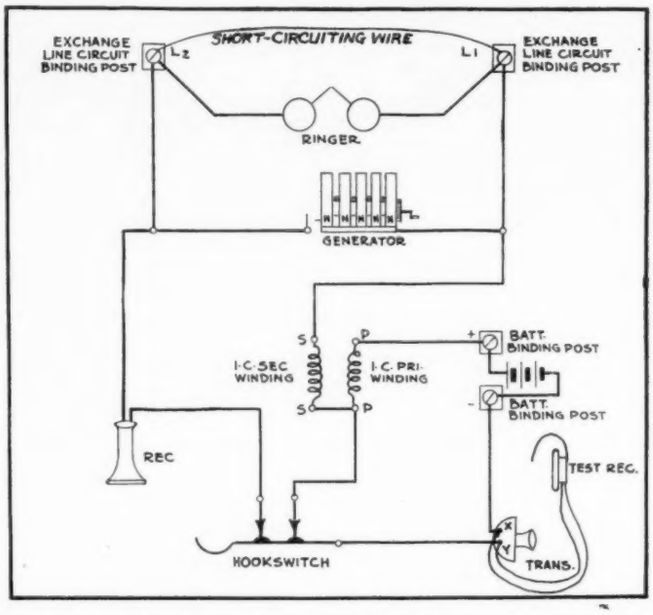


Fig. 1. Test Circuit for "Packed" or Short-Circuited Transmitters.

This fault is seldom caused by any defect in manufacturing, but more often is caused by some person tampering with the transmitter. In some cases "packing" may be due to manufacturing faults, although occasionally it is caused by some one opening the carbon chamber and spilling part of the granules.

If the transmitter is packed, this is equivalent to a short-circuit. It can be tested for by short-circuiting the telephone set line binding posts L_1 and L_2, and then connecting the clips of a test receiver directly across the transmitter terminals at points X and Y, Fig. 1, at the same time moving the hookswitch up and down while listening-in with the test receiver. If a very weak click, or no click, is heard, it is safe to assume that the transmitter resistance has been lowered, due to it being packed.

The result of this test, however, should not be accepted as final, because the fault may possibly be due to a short-circuit of the leading-in conductors, which can be very readily determined upon examination. By connecting the test receiver as just described, it is in multiple with the transmitter, and the transmitter being short-circuited, there is no resistance to the flow of battery current; in consequence thereof, all of the current will flow through the "short" and not any through the test receiver.

If, on the other hand, the transmitter is "open" when the test for a short-circuit is made, a loud click will be heard in the test receiver each time the hookswitch contacts are opened and closed.

When a scratching or frying noise is heard each time the magneto telephone is used, the first thing to find out is whether or not the trouble is in the telephone set circuit, in the transmitter, inside wire, or in the line circuit.

This can be tested for in the following manner: Connect the clips of a magneto test set across the line at the station protector and call the operator. If no noise is heard, connect the test clip across the line binding posts in the telephone set, and call the operator again.

If no more noise is heard in the test receiver at this point, then connect the clips to the transmitter binding posts and remove the telephone set receiver from the hookswitch, listen-in with the test receiver and telephone set alternately. If the scratching or frying sound is heard in the telephone set receiver and not in the test receiver, the fault is undoubtedly in the transmitter.

Another method of determining if the noise exists in the transmitter is to short-circuit the transmitter and then listen-in with the telephone set receiver. If the noise disappears and comes back again when the short-circuit is removed, the fault is in the transmitter.

If the primary and secondary windings of the telephone set induction coil are reversed, or the external connections thereto are reversed, transmission will be considerably affected. If this has occurred, the telephone will have very little side tone; that is, the transmitter will not be responsive to ordinary sounds.

A large percentage of transmitter troubles can be traced to missing mouthpieces, and to tampering with, or attempts to adjust the parts, which is usually unnecessary in most types of transmitters.

According to the principle that the variation in the value of the current passing through the transmitter is the most important thing, next to the consideration that the resistance should be as low as possible so that the slightest variation should be effective, it would seem to follow that the stronger the current flowing in the transmitter circuit, the more efficient the transmission of the sound. This, however, is not the case, for after a certain point, the current tends to heat or burn the carbon granules, thereby causing the transmitter to become noisy.

Night Repair Service of Ohio Bell Company in Cleveland.

As the first step in inaugurating a night repair service and in accordance with its policy of extending complete service to its subscribers, two trucks have been equipped by the Ohio Bell Telephone Co. for night outside repair service in Cleveland-West. The trucks and their crews take care of all repair orders that come in up to nine o'clock in the evening.

The Cleveland-East area also has a similar truck which works over the entire division until 12 o'clock p. m.

Jointed Bamboo Rod and Exploring Coil for Cable Trouble.

Frequently the writer has found suggestions in Telephony on telephone construction and maintenance methods that have proved valuable and which are now in use by our company. However, one of which I have never seen any description is the use of a jointed bamboo rod and attachment for holding an exploring coil in locating cable trouble.

Modern aerial cable construction is usually not more than 20 to 25 feet above the ground and can be reached by using a reasonable length rod. By this method.

(*Continued on page* 26)

The Strowger Group Selector Routiner

THE testing of an Automatic Telephone Exchange, with its many groups of components, is essentially a routine process, more economically and successfully accomplished by electro-mechanical methods than by purely human agencies.

The accompanying illustration depicts a "Strowger" Group Selector Routiner, designed to apply a series of searching tests to each Group Selector, switch by switch, in rapid succession, throughout a large public exchange.

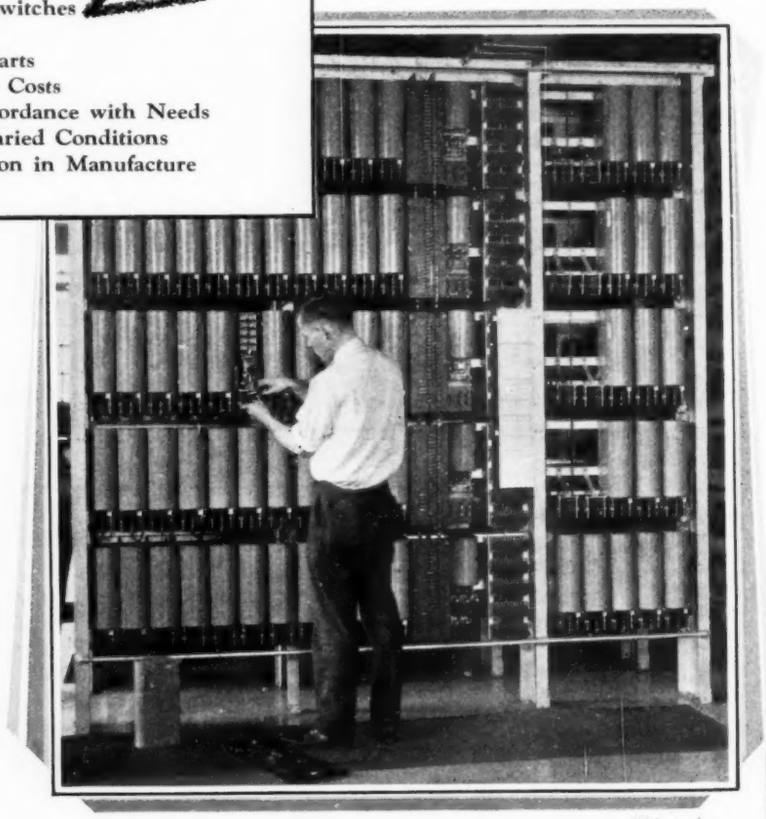
Routiners are also available for six other components of Strowger Automatic Exchange Equipment.

Automatic Telephone Manufacturing Company, Ltd.
Strowger Works, Liverpool, England
ASSOCIATED, COMPANY
International Automatic Telephone Co., Ltd., London

Interchangeable Switc
of Strow

Small Unit Design, a Basic Strowger Principle, Gives Strowger Dial Systems These Advantages:

1. Interchangeable Switches
2. Ease of Repair
3. Interchangeable Parts
4. Low Maintenance Costs
5. Expansion in Accordance with Needs
6. Adaptability to Varied Conditions
7. Quantity Production in Manufacture



The illustrations show the ease with which a connector switch is removed from the frame. It is only necessary to unscrew two nuts holding the bank to the switch, and lift the switch from its support. Lineswitch and selector removals or replacements are made just as easily and quickly.

STROWGE
DIAL S

When writing to Automatic Electric Inc., please mention TELEPHONY

add to Flexibility
Automatic Equipment

IN the Strowger Automatic Dial Telephone System, there are three main groups of switches, namely, lineswitches (or line finders), selectors and connectors. In the average exchange, there are in each of these groups, hundreds, perhaps thousands, of similar switching units which are uniform and interchangeable with each other within their particular group. They are all of small, easily-handled size, and it is but the work of a moment to remove any switch from the frame upon which it is mounted.

The advantages of such small unit design are many. If a switch should become impaired in action for any reason, it can be removed in an instant and replaced with a perfect one with practically no interruption of service. Another advantage is that a few units or whole sections of similar switches can be easily and quickly moved to other sections to cope with traffic requirements which might gradually change with movements in population, etc. Thus, every bit of equipment is always able to be utilized to its maximum capacity, this flexibility resulting in the high efficiency and economy of operation for which the Strowger system is universally noted.

Automatic Electric Inc.

Manufacturers of

STROWGER AUTOMATIC DIAL TELEPHONE AND SIGNALING SYSTEMS

Factory and General Offices: 1033 West Van Buren Street, Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia . Automatic Telephones, Ltd., Sydney
For Canada . Independent Sales and Engineering Co., Ltd., Vancouver
Elsewhere . The Automatic Electric Co., Ltd., Chicago

ASSOCIATED COMPANIES

American Electric Company, Inc. . . . . Chicago
International Automatic Telephone Co., Ltd., London
Automatic Telephone Manufacturing Co., Ltd., Liverpool
The New Antwerp Telephone & Electrical Works, Antwerp

AUTOMATIC
STEMS

When writing to Automatic Electric Inc., please mention TELEPHONY

(*Concluded from page 22*)

the average case of trouble in aerial cable can be located without climbing poles or riding cable, which is not only slow, but likely to dislocate rings and later cause trouble.

Vibration caused by riding cable also often clears trouble temporarily, making permanent repairs impossible until the trouble again appears. This is avoided by using a rod and coil.

We also use two receivers on each outfit, mounted on headbands as for radio use. This allows the tone to be more easily heard by excluding outside noises, and leaves both hands free to handle the rod and coil.

If a more detailed description or information can be used, the writer will be glad to furnish it.

York, Pa. DANIEL SEITZ,
Cable Superintendent,
York Telephone & Telegraph Co.

Signing on the Dotted Line.

By W. L. HUDSON,
Division Commercial Supervisor, Chicago Area, Illinois Bell Telephone Co.

Since then it is my mission, where'er by sorrow tossed,
To sell to worthy people good lightning-rods at costs.
With sure and strong protection I'll clothe your buildings o'er;
'Twill cost you—twenty dollars (perhaps a trifle more;
Whatever else it comes to, at lowest price I'll put;
You simply sign a contract to pay so much per foot).
I—signed it! While my family, all approvin', stood about;
The villain dropped a tear on 't—but he didn't blot it out!

So saith Will Carleton in the "Lightning-Rod Dispenser" in describing the signing of a contract by a trusting farmer who neither read nor understood its contents. As we commonly express it, the farmer "signed on the dotted line."

Did you think, to keep my buildin's out o' some uncertain harm,
I was goin' to deed you over all the balance of my farm?
He silenced me with silence in a very little while,
And then trotted out the contract with a reassuring smile;
And for half an hour explained it, with exasperatin' skill,
While his fellow-rogues kep' probably a-runnin' up my bill.
He held me to that contract with a firmness queer to see;
'Twas the very first occasion he had disagreed with me!

How many men in responsible positions habitually "sign on the dotted line" trusting that a subordinate has properly made up the document that is submitted. Now in any good organization certain documents require, as a supervisory measure, the signature or approval of the manager. Perhaps the two principal items are: letters to customers which reflect the tenor of the company, and vouchers waiving charges already billed which, in effect, is the same as taking cash out of the till and giving it back to the customer.

Now the manager naturally has many other things to do, but is there anything else that can be considered of greater importance?

The trouble is that just at the time these documents are placed before the manager for his attention his mind may be occupied with other matters; and in order to clear up his desk quickly, he glances through the ducuments hurriedly, assumes —and perhaps hopes—that everything is all right, takes a chance, and practically "signs on the dotted line."

He does not stop to realize that by his action he has:

First, violated a trust placed in him by his superior.

Second, probably indorsed some things that are flagrantly improper as to policy, detail, and business ethics.

Third, overlooked a golden opportunity to assist some of his subordinates in developing a better understanding of the details of their jobs.

Fourth, weakened his prestige, for the reason that his signature when affixed in such a manner does not mean—as it is intended it should—that he thoroughly understands and approves the matter at hand.

In other words, a man who "signs on the dotted line" is not in reality a manager but is more nearly a careless, indifferent clerk who has not taken the pains to know the facts before acting.

The manager should make his signature mean something.

In order to do so, he must thoroughly understand every document placed before him; and after having signed it, must be willing to accept full responsibility of any consequences resulting from his action.

He should never "sign on the dotted line!"

Building Up Brain Power Through Foremen's Conferences.

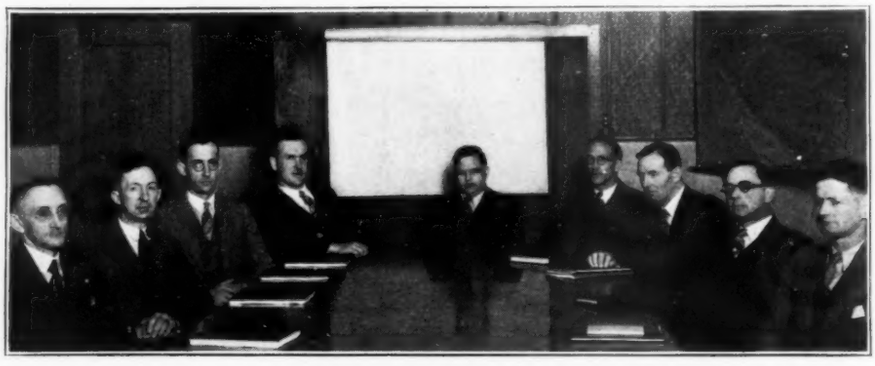
Realizing that the brain, like the muscles, gets sluggish and lazy when it is not exercised, the Pacific Telephone & Telegraph Co. has instituted a series of foremen's training conferences, which are really mental gymnasiums set up by the company to build up brain power.

The brain must be exposed constantly to new ideas which will improve its reasoning powers and add to its store of useful knowledge. The methods used in these conferences has as its purpose the subjection of each man's brain to the stimuli of thoughts contained in the brains of other men. It is called the developmental method.

The men sit around a table and discuss the essentials of their jobs. Indeed, the slogan of the conference is "Know Your Job!" Each man contributes ideas from his experience. If his ideas are sound, they are accepted after careful analysis. If they are unsound, they are discarded. The discussion is so directed that the group reaches its conclusions by collective reasoning.

The value of the conferences is far-reaching indeed. The members learn to think logically to a conclusion. They learn to marshal facts and to present them to their fellows in an intelligent manner. They learn to use their brains effectively and, most important, they learn to like to use them. The man who likes to think is like the man who likes to swim or run; liking to do is an excuse for doing.

Having once toned his brain up to par in the mental gymnasium, having learned how much fun there is in using his mental equipment, the employe will do a thinking job. He will analyze old ideas to determine their worth; he will be on the outlook for new ideas; he will master the job and derive a pleasure from it that he never had before.



A Foremen's Conference in Which Employes of Pacific Telephone & Telegraph Co. Take "Mental" Gymnastics.

Prices in the Metal Markets.

New York, August 5.—Copper—Steady. Electrolytic spot and futures, 18c. Iron—Steady; No. 2 f.o.b. eastern Pennsylvania, $20.50@21.50; Buffalo, $17.50@18.50; Alabama, $13.50@14.50. Tin—Steady. Spot, $47.37; futures, $48.12. Lead—Steady. Spot New York, 6.75c; East St. Louis, 6.55c. Zinc—Quiet, East St. Louis spot and futures, 6.75@6.80c. Antimony—8.62c. Quicksilver—$122.00.

Readjustment of Rates in Shreveport, La.

Southern Bell Telephone & Telegraph Co. Granted Authority to Increase Exchange Rates in Shreveport, La.—Commission's Order Stated Its Rates Were Among Lowest Schedules in United States For Cities Comparable in Size

The Louisiana Public Service Commission on July 27 authorized the Southern Bell Telephone & Telegraph Co. to place in effect increased rates for service within the corporate limits of the city of Shreveport, La., effective for service rendered by the company in the Shreveport base rate area for the month of September, 1929. The increased schedule of monthly rates is as follows:

Business, one-party line	$7.00
Business, two-party line	5.50
Business, five-party line	4.00
Residence, one-party line	3.25
Residence, two-party line	2.50
Residence, four-party line	2.00
Residence, five-party line	1.75

The exparte application which was filed by the Southern Bell Telephone & Telegraph Co. was general in its terms and set forth that the utility was not earning a fair return on its investment in Shreveport and asked the commission to prescribe schedules on the various classes of service.

By resolution of the commission the cases were referred to Commissioner Fields for hearing and recommendation, and his findings form the basis of the order in which all the commissioners concurred.

Following the filing of the company's application the city of Shreveport intervened in that proceeding, opposing any readjustment that would result in any increase.

It then filed a complaint and petition in which the company was made defendant. In this petition it asked that the same rates as were in effect on the date of the filing of the complaint be made applicable to all services within the new corporate limits of Shreveport. The cases were consolidated for hearing by the commission.

"While not a controlling factor in disposing of a proceeding such as this," the order comments, "a review of numerous telephone tariffs indicates that Shreveport is at this time enjoying a scale of rates for exchange telephone service which, if not the lowest in the United States, is certainly among the lowest schedules to be found for cities comparable in size with Shreveport.

"This is due in some measure to the fact that when the property of the company was under the control of the United States Telephone & Telegraph Administration, during and following the war, Shreveport was, so far as we have been able to learn, the only city of consequence in the United States which did not sustain an advance in its rates by order of the federal board.

It is explained by a witness for the company that this was due to the fact that negotiations were then pending between the telephone company and the operators of a local exchange at Shreveport, known as the Home Telephone Co., under which the Southern Bell company proposed to acquire the property of the local company, and so that these negotiations might not be interfered with by a rate readjustment the Shreveport exchange, by consent of the Telephone & Telegraph Administration, was left undisturbed as to its rates."

It was shown that an expenditure of not less than $1,000,000 for new plant would be required within the next 12 months to take care of service demands in sight. It was suggested by the company that some portion of the increased revenue which it sought in its application would be devoted to salary and wage increases to its employes.

Within the past two years a considerable area has been added to the corporate limits of Shreveport. This new territory includes Cedar Grove, South Highlands and Agurs. Under the existing base rates telephone subscribers in these areas are paying, in many instances, higher rates than are charged in that portion of Shreveport comprising the municipal area prior to the acquisition of the new territory, and the company proposed in its application to provide a uniform rate scale for Shreveport as its limits now exist.

Appraisal Placed in Evidence.

The company placed in evidence a detailed appraisal of its property in Shreveport devoted to exchange service. This appraisal was supported by testimony as to its manner and method of preparation and the valuations placed on the various elements of plant constituting the property. No serious attempt was made to dispute the existence of the property listed in the appraisal nor of the values placed on it other than a contention on the part of the city that the company's policy of charging off depreciation and building a depreciation reserve fund was improper.

"It is clear that based on either actual investment or reproduction cost new less accrued depreciation, the company is at this time earning on its Shreveport property devoted to exchange service a rate of return of less than 4 per cent," the commission said. "The expert accountant retained by the city for the purpose of checking the company's books and accounts, and presented as a witness, substantially admits the fact that the return is less than 4 per cent, and under one method of computation used by the city's witness he finds a rate of return even less than that claimed by the company."

It was not disputed that the company now faces and will continue to face a demand for additional service, which will require the investment of between $2,000,000 and $3,000,000 within the next four years. It was obvious that as this new money is placed into the plant even the present low rate of return will still further diminish. Particularly is this true because of the rapid development of the outlying residential districts of Shreveport, principally the newly-acquired territory noted above, for as the distance which new subscribers are located from the exchange plants increases the investment per telephone station increases in like ratio.

Readjustment of Rates Necessary.

The commission continued: "On the record as made we are convinced that some readjustment of rates must be made in the Shreveport area. The company has clearly shown that it is not earning a rate of return on its exchange property anywhere near that which the courts hold to be reasonable, but a continuance of the existing rates with the increased investment alleged by the company to be essential, and not disputed, would result in a return so low as to bring it within the range of confiscation.

"As to the distribution of the increase we have thought it proper to place a somewhat greater proportion of it upon the so-called business telephones. It seems to be the practice of regulatory bodies, and we deem it an entirely proper practice, to place the burden of increase in utility rates, within reasonable limitations, upon those who are best able to bear it.

It is true that under all telephone rate schedules a differential is added to rates for business service, for in the very nature of things the demand upon a telephone utility for service is far greater on the part of business houses than is the demand from residence stations; but traffic checks indicate that the calls originating at and destined to business telephones are increasing in a far greater ratio than applies to residence service. Both of these factors we think establish the propriety of giving the business telephones special treatment."

"The telephone rate situation in Shreveport was before the commission in 1926 on an application of the company for an increase. For causes which we then deemed sufficient the application was denied and the proceeding dismissed. In the instant

case the city has filed a plea of res adjudicata and urges that the matter is not now a proper subject of procedure before the commission because of the findings in the 1926 case. The plea is wholly untenable.

Regulatory commissions, while having some quasi-judicial powers, are primarily fact-finding and legislative bodies. The authorities are uniformly to the effect that the plea of res adjudicata does not run to the legislative functions of such commissions. Accordingly, the plea is overruled.

The city next contends that inasmuch as the Shreveport plant of the telephone company is but one unit of a state-wide system, no readjustment of the Shreveport situation should or may be had unless and until a proceeding having for its purpose an inquiry into the earnings of the company on its business within the state as a whole has been had. It further urges that no readjustment of the Shreveport exchange rates should be effected until Shreveport is credited with its fair and proper pro rata of revenue accruing from the toll or long distance service of the telephone company on calls handled by and through the Shreveport plant.

Over the objection of counsel for the telephone company that such testimony was immaterial, irrelevent and incompetent, considerable evidence was admitted on this point, and under an order of the commission the company was required to file a statement of its toll receipts accruing on account of operations in and through its Shreveport plant.

The company submitted the statement but contended that no allocation of toll earnings could be credited to any given exchange until a segregation of the property devoted to both toll and exchange service, state as well as interstate, was made.

No such general segregation has been made in this proceeding, but the company has segregated its exchange plant and serice in Shreveport from its toll plant and service, and where certain elements of property were used in common as between exchange and toll service, it has made arbitrary allocations of such property and service as between the two classes of service on what appears to be a fair basis.

These allocations appear on their face to be fair and they are supported by the testimony of the experienced and capable engineers who made them.

If the rate of return on the company's operations within the state as a whole were excessive or beyond a reasonable figure, it might be proper to give some consideration to the contention of the city in this respect. Even then, however, it would be the better practice to survey the rates of the state as a whole and make such adjustments in individual instances as might be warranted as proper. No such situation is presented, however, for the rate of return for the state as a whole for the year 1928 was less than 7 per cent.

Obviously, therefore, any rate adjustment under which the Shreveport operations contribute less than 4 per cent to the earnings for the state as a whole, where such state-wide earnings are less than 7 per cent is unduly preferential of Shreveport and discriminatory against subscribers to other exchanges in the state who are thus required, in substance, to make good the Shreveport deficit."

"The witness for the city calculated that, crediting the Shreveport plant with the toll receipts collected there, the Shreveport operations produced a return in excess of 9 per cent. He failed to charge against these toll collections at Shreveport, however, any proportion of the cost incurred in rendering such toll service or the value of the property devoted to such service.

As an illustration, a subscriber to the Shreveport exchange may place a call for a station in New York City. Assuming an arbitrary rate of $5 for such a call, under the theory of the city this $5, because collected at Shreveport, should be credited in its entirety to Shreveport operations; but no account is taken of the cost of rendering this service to the company on whose lines the call originated and its connecting companies between Shreveport and New York, or of the hundreds of thousands of dollars' worth of property placed at the subscriber's disposal beyond the confines of Shreveport. We think the fallacy of the contention is obvious.

Numerous bankers and business men of Shreveport were called as witnesses as to what invested money should fairly earn in Shreveport. The preponderance of this testimony is to the effect that a return of less than 7 per cent is unduly low; and some of them regard 8 per cent as entirely reasonable. These opinions relate to an investment in Shreveport of approximately the same as that of the telephone company's investment there."

The city questioned the propriety of the reserve for depreciation fund accumulated by the company, as to amount, and argued that the depreciation charges for this purpose were unduly high.

"Based on current operations," the order stated, "the rates which we shall prescribe will yield, on the basis of actual investment in Shreveport, a rate of return of 6.76 per cent; and on the basis of reproduction cost new less accrued depreciation, a return of 6.35 per cent; and under the decisions of the supreme court of the United States in the well known Indianapolis water case and the St. Louis and O'Fallon case, the latter case only recently decided, the reproduction cost of a public utility at the time of the inquiry must be accorded serious consideration. We have given it no greater weight than the courts command.

The rates which we shall prescribe are more or less experimental, for they cover types of service not now rendered by the telephone company in Shreveport."

Personal Notes from the Field

John H. Ainsworth, who has been serving as assistant engineer of the Kansas Public Service Commission, has resigned that position to become general manager of the Kansas Telephone Co. with headquarters at Topeka. He assumed charge on July 19.

Mr. Ainsworth served as assistant engineer in charge of the telephone department of the Kansas commission for a number of years and resigned about four years ago to take charge of the Meridian Telephone Co. with headquarters at Bennington. He severed his connections with the Meridian company to go back with the commission the early part of this year.

He has had 39 years of actual practical experience as a telephone man, having served with the old Central Union Telephone Co. and Ohio State Telephone Co., and also was with the Tri-State Telephone & Telegraph Co. of St. Paul, Minn., for a number of years.

Mr. Ainsworth succeeds R. J. Ardiff, who became general manager of the Kansas company at the time of its organization about May 1, 1928.

Frank X. Staub, veteran employe of the Home Telephone & Telegraph Co., of Fort Wayne, Ind., has been appointed to a newly-created position of commercial engineer, it was announced August 1 by Otto Marahrens, secretary and general manager of the company.

In making the announcement, Mr. Marahrens stated that the creation of the position which Mr. Staub will fill was made necessary by the increasing telephone needs of Fort Wayne's businesses and industries. Mr. Staub will advise with architects and builders, when requested, so that suitable arrangements for necessary telephone facilities will be a part of building plans. He will continue to have charge of all company buildings.

Mr. Staub has been in the employ of the Fort Wayne company for the last 34 years. His service began at a time

Frank X. Staub, Who Has Been Appointed to Newly-Created Position of Commercial Engineer of the Home Telephone & Telegraph Co., Fort Wayne, Ind.

when the company started the building of pole lines preparatory to serving Fort Wayne telephone users. Since then Mr. Staub has acted in various capacities for the company. In 1924 he was made building and equipment engineer, which he has been until his present promotion.

Mr. Staub is president of the Home Telephone Athletic Association. He is in charge of all safety work at the telephone plant and is also president of the Fort Wayne Safety Council. He is a member of the Telephone Pioneers of America and of the Independent Pioneer Telephone Association of the United States.

Obituary

David C. Phillips, president of the Iowa-Illinois Telephone Co. of Burlington, Iowa, died in his sleep at the Burlington hotel, Burlington, Iowa, during the night of July 31, as a result of heart trouble. He had resided in Grinnell, Iowa, since 1921 and was buried from there on August 2. He was one of Iowa's pioneer Independent telephone men and had many warm friends in the telephone field.

Mr. Phillips was born at Braidwood, Ill., June 26, 1875. He graduated from the Kirkville, Iowa, high school in 1890 and later took the surveying, mapping and railroad engineering courses of the International Correspondence Schools. He began work in the coal mines in 1890, working in and around the mines until 1896, when he entered the office of the mining engineer of the Wapello Coal Co. at Hiteman, Iowa, as helper.

He eventually worked up to the position of mining engineer, which position he filled until he resigned to enter the telephone business in 1898, beginning as troubleman. From 1903 to 1906 he was mining engineer of the Iowa State Board of Mine Examiners. In 1906 Mr. Phillips purchased the controlling interest in the Monroe Telephone Co., Monroe, Iowa, and was made its secretary and manager. In 1912 he secured the balance of the stock and was elected president of the company, the capital being increased from $10,000 to $20,000.

In 1914, he moved to Indianola, Iowa, where he ran a bookstore. During these years he was also interested in a Texas land development plan.

The fascination of the telephone business remained with him, however, and the longing to resume his connection with the industry became too great for him to resist. So in the fall of 1918 he became the president of the Citizens' Telephone Co. of Marengo, Iowa. In May, 1924, he sold that plant to the Agee Brothers of Orange City and took over the Interurban Telephone Co. of Orange City.

He next engaged in the buying of telephone properties, placing them in first class shape and then selling them. This he continued for several years until the founding of the Iowa-Illinois Telephone Co. in 1927. Of his activities during this period Mr. Phillips said: "I never left a property but what it was in better condition than when I took it over."

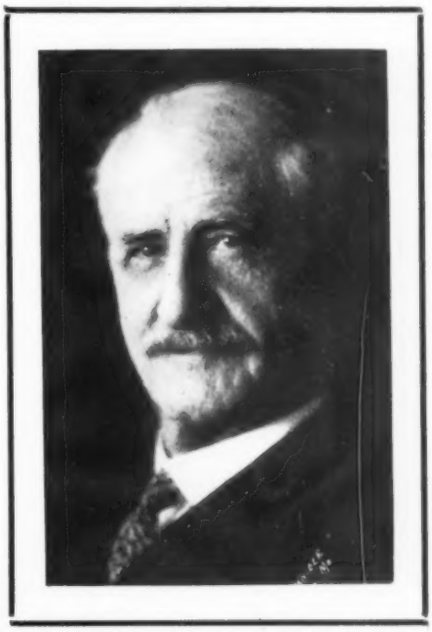
In 1927 the Iowa-Illinois Telephone Co. was organized and he became its president with headquarters at Burlington, Iowa. This company, through its subsidiary companies, operates a total of 9,000 stations from 23 exchanges in eastern Iowa and western Illinois, and the plant and service in every community it serves have been improved since coming into the possession of Mr. Phillips' company.

Mr. Phillips had a wide acquaintance among Iowa telephone men. He was a regular attendant at the annual conventions of the Iowa Independent Telephone Association and was its vice-president during 1922-1923. He was also a member of the Independent Pioneer Telephone Association of the United States.

The Late David C. Phillips, President of the Iowa-Illinois Telephone Co., Was Well Known to Iowa Telephone Men, Having Commenced in That State as Troubleman 31 Years Ago.

About two years ago Mr. Philips was badly injured in an automobile accident from the effects of which he never fully recovered. The many friends of Mr. Phillips learn of his passing with regret for he always had a kind word and friendly greeting for them. He had helped smooth the path of life for many of the younger men and aided them in attaining success in their work. He is survived by his widow, three sons and a daughter.

M. Fred Bell, 80 years old, for more than 50 years prominent in telephone, political and architectural circles of Missouri, died at his home at Fulton, Mo. on August 1. For 47 years he was manager of the Fulton exchange of the Southwestern Bell Telephone Co.



The Late General M. Fred Bell Was Manager of the Bell Company's Exchange at Fulton, Mo., for 47 Years.

General Bell established the Fulton telephone exchange in 1882 after corresponding with Alexander Graham Bell, inventor of the telephone. Fulton was one of the first of the small cities of Missouri to have telephone service. He served on the staffs of former Governors Stone and Stephens of Missouri, being adjutant general of the state during the Spanish-American war and was appointed assistant adjutant general by President McKinley.

He spent 50 years as an architect. Most of the larger homes and the public buildings in Fulton were built under his direction. General Bell was the second oldest man in Missouri in years of telephone service and was a member of the Telephone Pioneers of America.

Merton's New Fire Alarm Installation

Street Fire Alarm Boxes and Associated Fire Station Equipment Recently Placed in Urban District of Merton and Morton, Surrey, England—Special Features of Beasley-Gamewell System—Successful Demonstration of Equipment

By J. W. Catchpole

The urban district of Merton and Morden, Surrey, England, has recently been equipped with up-to-date street fire alarm boxes and associated fire station equipment in place of the obsolete boxes previously in service. These old boxes necessitated not only the breakage of glass protecting panel, thus exposing the key, but also the subsequent unlocking of the box door, before an alarm could be given.

The new boxes, which are of the Beasley-Gamewell non-interfering sector type, obviate the delay incidental to this process, the breakage of a glass bridge-piece immediately freeing a lever, which on being pulled down in accordance with the clear instructions on each box, sends in its code, and both signals and records the alarm at the fire station, together with the number of the box.

When its lever is fully depressed, the Beasley-Gamewell non-interfering sector box sends out four complete signals, each embodying the foregoing essential information. It also provides that no mutilation of a fire call takes place when two or more boxes on the same loop are operated simultaneously.

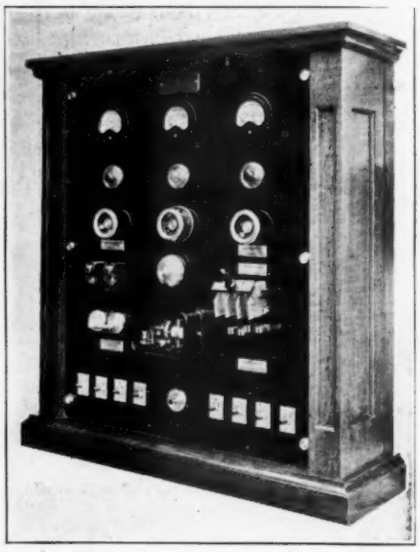
The signaling mechanism of each box is protected by three separate and distinct casings, affording ample weather safeguards and excluding dust and dirt from the contact surfaces, which are of pure platinum and of ample cross-section.

Each box is equipped with testing and earthing keys and adequately protected against lightning. A telephone jack for the use of firemen facilitates connection with a portable hand telephone, and permits conversation with the fire station.

The Beasley-Gamewell system operates on the closed-circuit principle, and is positive and self-testing at all times. A small current is always flowing through the loop and controlling alarm devices at the station, which operate immediately in the event of a line break at any point. Should it occur, such a contretemps can be temporarily circumvented by throwing a switch at the fire station, which enables the boxes on the broken loop to continue functioning until repairs can be effected. Similarly, in the case of an earthed line, the system remains unaffected and signals are received with normal speed and accuracy.

Such faults are detected by daily routine tests and may be remedied at any favorable opportunity.

When operated, a Beasley-Gamewell street fire alarm box momentarily interrupts the normally closed circuit to the fire station a definite number of times, and in regular sequence, corresponding with the code number of the box from which the signal is sent. The effect at the fire station is three-fold. An electro-mechanical gong responds with one stroke for each break in the circuit, and, simultaneously a



Two Loop Fire Station Switchboard of the Merton & Morden Urban District Council, Surrey, England.

¼-inch hole is punched in a traveling paper tape, permanently recording the signal.

During the foregoing cycle a trembler alarm bell rings continuously.

The Merton installation embraces 20 of these boxes, connected in series on two loops, which terminate at the fire station on the switchboard illustrated. This switchboard is equipped with the necessary instruments, voltmeters, ammeters, switches, keys, etc., for controlling and testing the circuits, as well as for charging and changing over the storage batteries from which the system is operated.

Provision is also made, by means of extension circuits and the A. T. M. firemen's call-bell system to ring the box code in every fireman's house whenever an alarm comes in.

The lines connecting the street boxes with the fire station are leased from the post office, and the new installation was successfully cut into service on April 27 last.

All of the street boxes and fire station equipment were manufactured to the order and specification of the Merton & Morden urban district council by the Automatic Telephone Mfg. Co., Ltd., Strowger Works, Liverpool, England.

As indicating the longevity and reliability of the Beasley-Gamewell fire alarm system sponsored by this company, the original installation now displaced by that described, was also Beasley-Gamewell, and comprised 14 street boxes with associated

The Beasley-Gamewell Apparatus at the Merton and Morden, Surrey, England, Fire Station, with Fire Chief Pointon in Foreground.

LYON
offers Telephone Companies
A COMPLETE STORAGE SERVICE

FOR many years Lyon engineers have worked with telephone men and studied the storage needs of this specialized industry. As a result Lyon has developed many products, now universally adopted, that simplify the purchase and installation of storage equipment.... In steel shelving, for instance, Lyon has developed many standard arrangements of shelves, bins and dividers for the purpose of carrying stock on the least possible floor space with the items most frequently in demand easiest to get. Such arrangements are not permanently fixed, however, because Lyon Steel Shelving is adjustable. Changes can be made at any time.... You will find Lyon Telephone Bulletin 314-B a real help to you in ordering the sections of shelving you need to make up your racks. It will also give you complete information on the many other Lyon Steel Storage Products that serve the storage needs of every department of the industry. Write for it today.

LYON METAL PRODUCTS, INCORPORATED
AURORA, ILLINOIS

LYON WIRE CHIEF'S TOOL CABINET

LYON LI-FLAT CABINET FOR BLUEPRINTS

LYON JANITOR'S CABINET

LYON
STEEL STORAGE EQUIPMENT

SHELVING LOCKERS CABINETS COUNTERS

LYON METAL PRODUCTS

FOLDING CHAIRS
GENERAL STEEL STORAGE AND DISPLAY EQUIPMENT

When writing to Lyon Metal Products, Inc., please mention TELEPHONY.

fire station equipment installed in October, 1909.

This original equipment has thus functioned satisfactorily for 20 years before being replaced by modern and improved apparatus on the same principle.

On Saturday, June 8, the Merton fire alarm installation was inspected by a number of councillors, who witnessed a demonstration of its efficiency in receiving and recording calls.

Among those present were Councillor J. J. Winder, chairman of the fire brigade committee, Councillor C. R. Inskip, chairman of the finance committee, Mrs. Sleet, and C. J. Mountifield, clerk of the council.

Following this successful demonstration of the new system a further visit was paid by a party of councillors from Epson who also inspected the installation.

The Epsom visitors included Councillors C. E. Irish, chairman; G. Aldway, chairman of the fire brigade committee; Cawley, Watling, Skilton and Cashine.

Merton's able fire chief, Mr. Pointon,

Beasley-Gameweli Non-Interfering Sector Box Street Fire Alarm.

was in attendance and explained the details of the installation to the visitors, who expressed their satisfaction with the improved and highly efficient facilities now available in the Merton and Morden area for notifying outbreaks with a minimum loss of time.

Employes Dined by Management After New Subscriber Campaign.

Employes of the Rushville Co-Operative Telephone Co., of Rushville, Ind., were entertained recently at a dinner by the management in appreciation of their work during the recent business campaign of the company. Eighty-five per cent of the employes were present. M. E. Hauch, of Fort Wayne, solicitor of the company, was a guest.

Following the dinner, George H. Davis, local manager, complimented the employes for excellent work during the campaign, which had lasted for 60 days. During the campaign, 222 new telephones were installed, a considerable increase in business in so small a town as Rushville. During the campaign the company did not charge new subscribers for installations.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Northern Indiana Company Asks for Uniform Toll Rates.

Uniform toll rates and toll call regulations between telephone companies of the northern part of Indiana have been requested of the Indiana Public Service Commission by Carl H. Mote, president of the Northern Indiana Telephone Co. The request was made in a petition filed on July 30.

Mr. Mote complains in his petition that discriminatory rates have been charged and arbitrary methods of routing long-distance calls have been practiced in the interchange of traffic by 16 telephone companies connecting with the area of the Northern Indiana. He requests that each company have the privilege of routing long distance calls originating in its area over its own lines as far as possible and that other companies be required to accept and complete such calls with "due diligence."

Companies made parties to the action are the Winona Telephone Co. at Plymouth, the Commercial Telephone Co. at Warsaw, the Royal Telephone Co. at Milford, the Nappanee Telephone Co. at Nappanee, the Bremen Home Telephone Co. at Bremen, the Public Service Telephone Co. at Leesburg, the Tippecanoe Telephone Co. at Tippecanoe, the Rochester Telephone Co. at Rochester, the Grass Creek Telephone Co. at Grass Creek, the Twelve-Mile Telephone Co. at Twelve-Mile, the Denver Telephone Co. at Denver, the Roann Telephone Co. at Roann, the Urbana Telephone Co. at Urbana, the Largo-Andrews Telephone Co., the Whiteley County Telephone Co. at Columbia City and the Pierceton Telephone Co. at Pierceton.

Asks Stock Increase Approval; Money for Betterments.

Certification of an issue of $352,400 worth of common stock by the United Telephone Co. was asked of the Kansas Public Service Commission in an application filed July 25. Proceeds of the stock sale are to be used to reimburse working capital for betterments on its system between September 30, 1927 and February 28, 1928, the application stated.

The statement accompanying the application sets forth that the United Telephone Co. has total assets of $6,218,834. Included in its liabilities are $1,761,000 of common stock outstanding; $2,569,600 of 7 per cent preferred; $49,700 of 6 per cent preferred; $14,007.34 installments; or a total of $4,395,307.34 stock oustanding.

Indiana Commission Refuses Rehearing of La Porte Case.

The Indiana Public Service Commission on August 2 refused to reconsider its order denying a public utility the right to increase temporarily its rates to raise funds for rehabilitating its property. The company was the LaPorte County Indiana Telephone Co. The commission on July 26 denied the company a temporary rate increase by which it sought to recondition its property that was damaged by a storm May 2. The original order held that the company already had collected funds which should have been available as a depreciation account.

This money, the commission found, had been used for permanent improvements. The order followed a hearing conducted during the morning in which attorneys urged a rehearing. It was the assertion of the attorneys that the company's property was damaged to the extent of $140,000. That serious damage resulted to the system was denied by representatives of La-Porte. They declared the system was in operation the day after the storm.

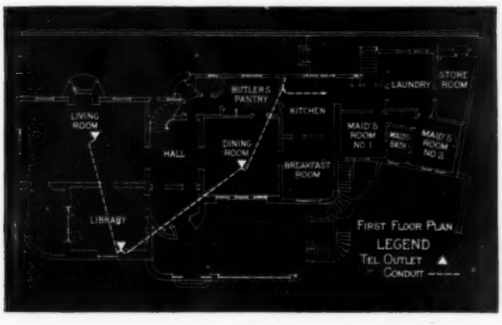
Purchase of Eight Michigan Companies Approved.

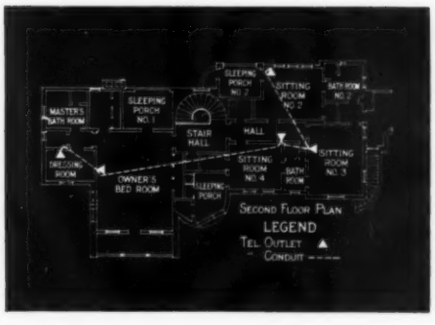
The Michigan Public Utilities Commission has approved the purchase by the Tri-County Telephone Co. of South Haven, of eight Independent company properties throughout the state.

The companies absorbed by the Tri-County company are: Lewanee County Telephone Co.; Citizen's Telephone Co. of Schoolcraft County; Citizen's Telephone Co. of Alcona County; Montmorency Telephone Co.; Roscommon Telephone Co.;

The Telephone needs of the Nation are Changing

The Piedmont, California residence of Mr. R. J. McMullen, with accompanying floor plans, showing the telephone outlets and conduit layout which provide for modern telephone convenience.—FREDERICK H. REIMERS, Architect.





WITH the growing appreciation of the important part communication plays in everyday life, there is coming a radical change in the telephone needs of the nation. Especially is this true as to the number and location of telephones within the home. Where previously one, or possibly two telephones were considered sufficient, people today want telephones throughout the house. . . . Particularly in those rooms most frequently used, so that calls may be made and answered without waste of time or effort.

Many architects are providing for this modern convenience in their plans for new and remodeled residences. By consulting with their clients, and with representatives of the local telephone company, they can determine not only what rooms are desirable for telephone locations, but also what places in those rooms are most suitable. In addition, planning in advance for the telephone arrangements makes it possible to lay conduit for wires within the walls, thus affording protection to the wires, and resulting in improved appearance.

Many other things contribute to modern telephone convenience. Your Bell Company will be glad to explain them to you—and to help you plan the telephone arrangements for your new building projects. Just call the Business Office.

In this advertisement, appearing this month in architectural magazines, the Bell System calls attention to the growing demand for comfort and convenience in the telephone arrangements of the home.

Grayling City Telephone Co.; Oscoda Farmers Mutual Telephone Co. and the Northwestern Telephone Co. at Mio.

The Tri-County company is authorized by the commission's order to purchase the one-half interest of the Michigan Bell company in the Lenawee County Telephone Co. through the sale of 2,500 shares of its 6 per cent cumulated preferred stock. For the remaining properties the company is authorized to sell $400,000 of its 5½ per cent bonds.

Company Permitted to Operate in Trego County, Kans.

Two telephone companies are now operating in Wakeeney, Kans., as a result of an order granted by the Kansas Public Service Commission permitting the Trego County Cooperative Telephone Co. to operate in Trego County.

The Co-operative company has been trying to get a certificate for nearly a decade. It was organized 12 years ago by a group of farmers and Wakeeney people who were unable to get the service they desired from the local company at Wakeeney. They put about $45,000 into the venture.

Several years later they wanted to go into the telephone business—under the law only members could get telephone service from the Co-operative company. But the state commission turned it down. Meanwhile the Wakeeney company passed into the hands of the Central Kansas Telephone Co.

Under the order issued by the Kansas commission, the Trego County Co-operative Telephone Co. can go after all the Trego county telephone business it wants.

Minnesota Company Ordered to Charge Authorized Rates.

The Minnesota Railroad & Warehouse Commission in a recent order directed the Pequot Rural Telephone Co. to furnish adequate service to all subscribers at Pequot and to install the O. F. Morrow telephone and the P. O. Hawkinson telephone and those of any other subscribers which had been discontinued because of failure to pay the excessive and unauthorized rate charged by the company.

A complaint filed by O. F. Morrow stated that inedaquate service and unjustifiable rates were charged by the Pequot company, the rates not having been authorized by the commission.

From the evidence and an investigation of the lines of the company, the commission found that the Pequot company's lines were not in good repair nor properly maintained, resulting in inadequate service. The rates charged were billed by the company the first of the month, requiring the subscribers to pay in advance and in case they were not paid in advance an additional charge of 25 cents per month was made by the company and referred to as a penalty.

It was shown that O. F. Morrow was charged during the month of October a rate of $2 per month with an additional penalty of 25 cents per month if not paid in advance and in the month of June was charged $1.50 with an additional penalty of 25 cents per month if not paid in advance, while it appeared to the commission that his rate charged should not have been in excess of $1.00 per month net.

The commission ordered the Pequot Rural Telephone Co. not to collect rates in advance and to repair all of its lines complained of and improve all its lines so that it would be capable of furnishing service to all of its subscribers and continue to give 24-hour service.

Rural Lines Purchased by Scotia (Mo.) Telephone Company.

The Missouri Public Service Commission in a recent order, authorized the Scotia Telephone Co. to buy the telephone lines connecting with the exchange at Ulman in Miller county, belonging to John F. Blize for the sum of $250. The property includes the following:

1. Telephone line extending from Ul- towards Tuscumbia and known as Tusman north a distance of three miles cumbia-Ulman line.

2. Telephone line extending from Ulman south a distance of three miles toward Brumley and known as the Ulman-Brumley line.

3. Telephone line extending from Ulman east a distance of three miles towards Iberia and known as Ulman-Iberia line.

Question of Franchise Valuation of Utilities Before Board.

The entire franchise valuation question was thrown open again before the Nebraska state board of assessment, following an opinion by Attorney General Sorenson advising the members that millions of dollars worth of franchise values of telephone and power companies had apparently escaped taxation, and that the board has the alternative of taxing these values or of increasing the property tax of any corporation which has been assessed too low.

Mr. Sorensen says that the separate pieces of tangible property and the money and bills receivable of public service corporations, while assessed by local officials, obviously are assessed lower than the real value. The difference between the assessed value of the visible property and the actual valuation of the company, although intangible in form, is property that has value, produces income, and is the basis for credit at any bank. He holds that it is a cardinal rule that whatever property is worth for the purpose of credit, sale or income, no matter what its form, it is worth for the purposes of taxation.

The attorney general cites the law setting up the procedure for fixing franchise values and quotes from a state supreme court decision to the effect that if the rule or manner prescribed by the legislature in fixing a franchise value is reasonably fair and just in its operation, and is measurably proper and fairly well adapted for the attainment of the end required, it will not be interfered with for the reason that it is practically impossible to obtain exactness.

Later in the discussion, attorneys for the telephone and power companies pointed out that in the same decision the court held that gross earnings is not a fair value of the franchise, since if the business is conducted at a large profit its value is enhanced, while it is worthless where conducted at a loss. They said that in the case of telephone companies, among others, the profits of the business and consequently the value of the franchise depend very largely upon the rates which they are authorized to charge for the service performed.

"There has been some question," said the attorney general, "as to whether or not franchises should be taxed since public service corporations are not permitted to capitalize the franchise value for rate-making purposes. So far as that goes, the franchise value as a matter of fact is now reflected in the valuation of most public utility companies for rate-making purposes.

"The reason why a franchise value should not be a basis for rates is that the franchise is a gift from the state, and the people should not be taxed on their gift, every rate being in fact a tax. Of course, the taxes paid would add to the operating expenses of the company, and the company having the right to a fair rate on its valuation after payment of all operating expenses, the taxing of the franchise value would tend to slightly increase rates, but not very much.

If, for example, we value the franchise of a certain public service corporation at $10,000 it would compel the company to pay additional taxes of only $250. The company could not ask for increased rates that would yield 8 per cent on $10,000, but could only ask for an increase in rates to yield $250.

The Northwestern Bell Telephone Co. is only assessed on the basis of 11 million dollars, but in its reports to the state railway commission fixes the book value at 21 millions. The actual value of the property is probably several millions more. The Nebraska Power Co. is assessed on the basis of approximately 13 millions, while the actual value is somewhere between 22 and 30 millions. The same variance exists as to a large number of other public service corporations.

Even assuming that the assessment was made on a 75 per cent basis, it is obvious that the franchise value of these companies amounts to several millions which have escaped taxation all these years. It is the opinion of this office that

TELERING

ONE REED!

ONE CON-TACT!

IDEAL WAVE FORM

MONEY BACK GUAR-ANTEE

Converts 60 Cycle Lighting Current to 20 Cycle Ringing Current

NO RADIO INTERFERENCE

Very low current consumption

Try out our Heavy Duty Model
EX TELERING
equipped with Filter and be convinced.

Price $44.00—F.O.B. Elyria

IT PAYS FOR ITSELF

Sold by Leading Telephone Distributors

Manufactured by

The Colson Co., Elyria, Ohio

(Write for booklet)

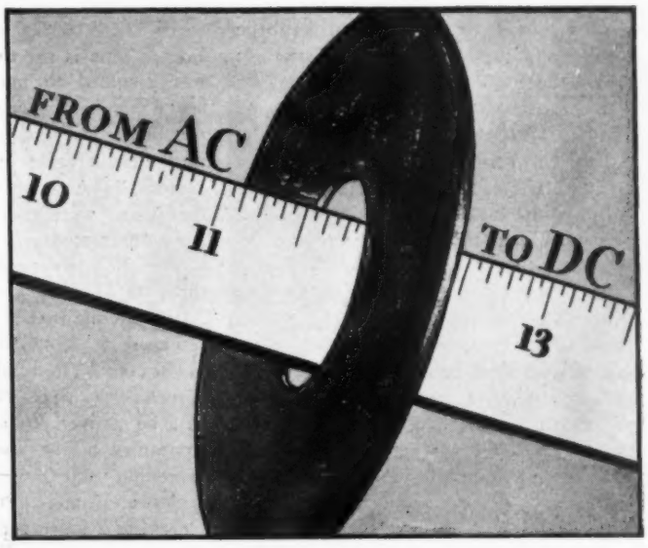
Crapo
GALVANIZED PRODUCTS

The pure zinc coating on *Crapo* Galvanized Telephone Wire and Strand is *non-peeling, non-cracking.* Even when subjected to splicing, twisting or bending, this protective coating remains uninjured.

That is why *Crapo* Galvanized Products are outlasting all others in actual service. That is why users, year after year, are reducing maintenance costs to new low levels....

Crapo Galvanized Telephone Wire and Strand can be obtained from representative Jobbers. Insist upon *Crapo* quality! You can identify it by the *Crapo* Tag....

Indiana Steel & Wire Co.,
Muncie, Indiana



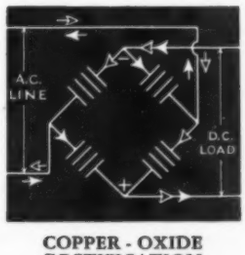
Reducing conversion to . . . a fraction of an inch

This fraction of an inch — an infinitely small fraction — lies between a copper disc and a layer of copper-oxide coated on one side of the disc. Because of it, electricity can pass through the disc freely in one direction and is opposed in the other. Yet in this phenomenon there is no chemical action . . . no deterioration of the medium . . . no wearing out of the disc.

Utilizing this principle, Westinghouse has developed a method of rectification that costs nothing once the equipment is installed . . . that requires no attention and no maintenance. Westinghouse Rectox Rectifiers, built from these simple copper discs, have no moving parts and require no electrolyte for their operation. They provide a means of producing direct current from available AC lines that is unmatched for simplicity, for positive action, for economical operation.

In electric power companies and industrial plants, there are many points where direct current is needed and only alternating current is available, and where Westinghouse Rectox will provide the final solution of the rectification problem. Send in the coupon for detailed information about this new development and its application to your problem.

RECTOX



COPPER - OXIDE RECTIFICATION

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
Merchandising Department
East Pittsburgh Works, East Pittsburgh, Pa.

Westinghouse

Westinghouse Electric & Mfg. Co.
Rectifier Section,
East Pittsburgh, Pa.

Gentlemen:

Please furnish me more information about Rectox Copper-Oxide Rectification.

Name.....

Address.....

City..... State.....

the state board of equalization has the authority and the duty to fix a franchise value of these companies and to cause the franchise value to be assessed on the same basis as tangible property. Where the variation between the assessed value and the actual value is beyond reason, your board should cause a reassessment of the property of the company in addition to determining the franchise value."

Public service corporation attorneys who discussed the matter before the board confined their remarks to the methods that should be employed in fixing values, waiving all argument on the injustice of taxing them for the right to do business which is neither exclusive nor perpetual, and exposes them to competition since there is no rule of convenience and necessity applied in Nebraska.

One power company attorney said that municipal competition had practically destroyed its business in its three best towns. Another pointed out that where such competition exists, as it does at a number of points, there is no way to pass a franchise tax onto customers and it would be inequitable to assess them for a value that is non-existent.

It was pointed out also that many companies that give good service are in no better than a 70 per cent physical condition. If a franchise tax is a property tax and property is in 70 per cent condition, the stocks and bonds value would not be a fair measure as these represent earning power. It was suggested that net earnings would be the fairest method of valuing franchises because they indicate what they are worth.

Much of the value of public service corporations lies in personal property, and in Nebraska this does not average more than 40 per cent of its value. Mr. Sorensen agreed that a franchise is property and that its value depends upon the condition of the property. In determining these values the board should take into consideration all elements, as the statute indicates.

After considering the matter the board ordered a 20 per cent increase in the assessment of all telephone companies, and fixed a value of $1,000,000 on the franchise of the Northwestern Bell Telephone Co. and $200,000 on that of the Lincoln Telephone & Telegraph Co. The 20 per cent increase in taxes will hit these two companies hard. Last year the Bell company paid a total of $592,000 taxes in Nebraska, while the Lincoln company paid $191,000.

The two telegraph companies are faced with a 40 per cent increase in taxes, while all electric light and power companies were increased 10 per cent or $2,994,000 in valuation. A similar increase was placed on all cattle, totaling $9,397,000. The increase in valuation of telephone companies is figured at $3,366,000. The total assessed valuation of the state was found to be $3,185,000,000, an increase of 60 millions. This is the first time that the state has assumed to tax franchises, and the board members were silent as to the method pursued. The law requires them to take into consideration half a dozen different factors. The resolution of adoption recites that these were used in reaching the results announced.

The Bell company's property was retured at $11,000,000 and is increased $2,200,000, while that of the Lincoln company, returned at $5,436,000, was increased by $1,087,000. These figures do not include franchise values. The same percentage will be applied to all the 206 telephone companies in the state. Franchise values exceeding $1,000 were fixed on 34 companies, and upon these they will pay a tax averaging 2.5 per cent.

Subscribers Protesting Rate Increase Hear from Commissioner.

Railway Commissioner Randall, member of the Nebraska regulatory body, gave some straight talk to a group of patrons of the Lincoln Telephone & Telegraph Co. who appeared to protest against an increase in rates at Wahoo, where the company recently built a $22,000 exchange and changed from magneto to common battery and from grounded rural to metallic service.

Two lawyers offered in evidence a franchise ordinance passed in 1913 fixing lower rates than those asked for by the company. Mr. Randall told them that as attorneys they ought to know that the commission is the only body in the state authorized to fix rates, not even the legislature being superior in that respect.

"Then you won't let this copy of the franchise ordinance be introduced in evidence?" one asked.

"Sure, put it in," replied Mr. Randall, "but it won't do you a bit of good because the commission is not bound by it, nor is the company."

An offer to show that the property is reported at a very much less figure for taxation purposes than was shown in the case was rejected by Mr. Randall, who said that the sole business of the commission was to find out what the actual value of the property used for public purposes is and to fix rates that would give a reasonable return thereon. He also refused an offer to show what rates are charged at other places.

"That makes no difference," he said. "Some of these may be higher and some lower, and in no event are they controlling as to what rates shall be charged at Wahoo."

John O. Smith, a former member of the legislature, and a farmer, protested that he was satisfied with the grounded service given him as a farmer and did not want to pay any higher rate. Mr. Randall said that the observation and experience of the commissioners was that the gridironing of the state with power company high tension wires had seriously interfered with rural telephone service, and that it was advising the substitution of the metallic system, one of the duties of the board being to see that good service was given.

Mr. Randall said that the protestants ought to get it into their heads that good telephone service costs but very little more than poor service, and that the small difference in price, usually 25 cents a month, insures everybody good service. In any event, the commission will not consent to deprive patrons who want good service merely to please a few persons on the line who want poor service just because good service costs a few cents more.

Mr. Smith complained that the company had been sending its representatives around to interview parons with respect to the kind of service they wanted. Mr. Randall told him that this was done under advice of the commission which desired patrons informed as to what was being contemplated where applications for rate increases were to be made, rather than spring it on them and excite them to protest merely because they were not advised as to the program of betterment.

Mr. Randall said that there were three elements of good service, and that these added to the cost. One was a properly constructed and modern service plant, another was good operators, and the other was efficient policing of lines in the interest of good maintenance. All these cost money, and it had been the experience of the commission that when the patrons were informed in these respects they did not object.

In fact, a number of communities have petitioned for better service and at the same time set down their willingness to pay whatever rates the commission decided was proper and which gave the company an adequate return.

Pennsylvania Bell Acquires Properties of Bethel Company.

The Interstate Commerce Commission recently authorized the Bell Telephone Co. of Pa. to take over the properties of the Bethel Telephone Co., which operates exchanges at Library, Allegheny county, and Finleyville, Washington county, Pa., which serve 596 and 247 subscriber stations, respectively, and 10 pole miles of toll lines.

The territory in which the Bethel company operates, the commission found, adjoins the city of Pittsburgh, and logically is a part of the Bell company's Pittsburgh metropolitan area. This section is being developed rapidly by people moving there from Pittsburgh. Homes of a better type are being built, and a higher grade of telephone service is required than the Bethel company is able to furnish, because of its inability to finance necessary additions to plant and equipment.

On January 11, 1929, the Bell company

contracted to purchase all of the physical and tangible properties of the Bethel company for $85,000. An appraisal made by one of the Bell company's plant engineers found the reproduction cost new of the properties to be $141,766.26, and less depreciation $79,635.87. The estimated value of the property to be retired from service is $14,095.93.

In 1928, operating revenues and operating expenses of the Bethel company were $33,027.65, and $25,973.99, respectively.

The Bell company is operating in the territory surrounding that served by the Bethel company, and upon acquiring the properties in question, will proceed immediately to construct the additional facilities necessary to provide a proper service.

Nebraska Modifies Orders on Railroad Crossing Construction.

Secretary George M. Kloidy of the Nebraska Telephone Association has succeeded in getting the Nebraska State Railway Commission to change its order with respect to the regulations describing the manner in which any and all wires shall cross over and under railroad tracks. Mr. Kloidy had failed to receive proper notice of the hearing, when first held, and when he presented a request a rehearing was ordered.

The record shows that the Independent telephone companies objected to the stipulation for the reason that a distance of 24 feet from the center of the railroad track, measured at right angles, is greater than the clearance provided in the national electric safety code and in the specifications issued by the Bell telephone system.

They also objected for the reason that the 24-foot clearance would add to the cost of undergrade crossings and necessitate the construction of overhead crossings in the interest of economy, whereas public safety requires undergrade crossings where they are practicable; and, further, that the 24-foot clearance would put a burden on the use of the public highway at railroad crossings, which is not necessary for the ordinary and necessary operation of a railroad.

Burlington engineers testified that a net clearance of 22 feet on either side of the track is required to move the company's equipment described as the Jordan spreader, over its tracks, when it is ready for operation. The commission found, however, that in its operation the machine is assembled and taken apart, and that it is not used on that part of the right of way used as a road. It also found that in the operation of double tracks the outside clearance is 14 feet. The national electric safety code provides for a 12-foot clearance. All over the country its provisions are recognized as controlling in the absence of rules by boards and commission of the different states vested with authority.

Having all these facts in mind, the commission holds that the 15-foot clearance be substituted, and made a part of the original order, which will read:

"For the conduct of supply line circuits, the conduit shall extend across the right of way and terminate in a manhole at each end. For the conduct of signal circuits the conduit shall extend at least 15 feet from the center line of the nearest track, measured at right angles to said center line, on both sides, at which points risers may be erected. The risers shall in no event be of a height above ground which exceeds the distance from the base of the riser to the nearest rail.

"In cases where it is necessary to guy the riser pole toward the track, the minimum clearance of 15 feet from the center line of the nearest track shall be provided from the base of the guy wire. In the event of the construction of additional railroad tracks, the conduit shall be extended so as to provide the minimum clearance above provided from the center of the nearest track.

"The vertical clearance between the bottom of the rails and the top of the conduit shall not be less than 42 inches, except where the ballast section for cleaning is less than 42 inches. In the latter case, this clearance may be reduced to not less than 30 inches, and in all cases the top of the conduit shall be so located as not to be exposed between riser poles."

Pennsylvania Bell Authorized to Acquire Telephone Properties.

The Bell Telephone Co. of Pa. was authorized on July 23 by the Interstate Commerce Commission to take over the properties of the Cresco & Greentown Telephone Co., which owns and operates a telephone system in Monroe and Pike counties, Pa., with an exchange at Canadensis which serves 221 main subscriber stations and 179 private branch exchange stations. The properties include 2.5 miles of toll pole lines.

On March 21, 1929, the Bell company contracted to purchase all the physical and tangible properties of the Cresco company, free from all liens and encumbrances, for $40,000, payable in cash. An appraisal made by the plant engineer of the Bell company found the reproduction cost new, less depreciation, of the properties to be $24,146.52.

The properties are carried on the balance sheet of the Cresco company, as of December 31, 1928, at $42,113.96. The rates to be charged after the transfer of the properties will be less than now in effect.

Wisconsin State Long Distance Company Increase Rates.

The State Long Distance Telephone Co. was recently authorized by the Wisconsin Railroad Commission to discontinue its present schedule of rates for multi-party rural and seasonal service and place in ef-

Keeping Faith
with THE PUBLIC

MAINTAINING the finest service possible is but the every day duty of a telephone company in carrying out its contract with the public.

"Keeping faith" simply means "use good judgment in the selection of your equipment."

STORM KING batteries have developed a new insulating material, more highly absorbent than any other, which will retain the chemical solution much longer than anything so far developed. The result is the longest service life ever developed in a telephone battery and this in turn means substantial savings to telephone companies in cutting down renewal costs to a new low point.

Manufactured by

GENERAL DRY BATTERIES, INC.
Cleveland, Ohio

Distributors:
A. J. Johnson Elec. Co., Chicago, Ill.
W. S. Nott Company, Minneapolis, Minn.
Suttle Equipment Co., Lawrenceville, Ill.

Valuation—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
JAY G. MITCHELL
TELEPHONE ENGINEER
Member A. I. E. E.
Member W. S. E.
1509 South Park Ave. Springfield, Ill.

Frank F. Fowle & Co.
Electrical and Mechanical
ENGINEERS
Monadnock Building CHICAGO

COFFEY SYSTEM & AUDIT CO.
CERTIFIED PUBLIC ACCOUNTANTS
Consolidated Bldg. Indianapolis, Ind.
AUDITORS

Creosoted
CEDAR POLES
Prompt Shipment via Rail or Water
CASCADE TIMBER CO.
822 Tacoma Building Tacoma, Wash.

J. K. JOHNSTON
TELEPHONE
JJK
ENGINEER
INDIANAPOLIS
During recent years I have been privileged to appraise Telephone Exchanges all over the United States. The list totals 663. Would you like to avail yourself of my services?
903-4 Lemcke Building

CONSULTING TELEPHONE ENGINEERS
W. C. POLK J. W. WOPAT
Plans, Estimates and Reports,
Appraisal and Supervision
Can arrange a moderate amount of financing
406 West 34th St. Kansas City, Mo.

W. H. CRUMB
Telephone Engineer
9 South Clinton St. Chicago

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies
J. G. Wray, Fellow A. I. E. E.
Cyrus G. Hill
2130 Bankers Bldg., Chicago

fect the following schedule of monthly rates and rules:

Rural multi-party business, $3; seasonal multi-party business (yearly contract), $3.00; seasonal multi-party residence (yearly contract), $2.00.

The increased rate affects 28 business rural and seasonal subscribers only and will increase the revenues of the utility not more than $350, the commission stated. This will not materially affect the rate of return on the utility property, which in 1928 was not excessive.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

July 23: Bell Telephone Co. of Pa. authorized to acquire the properties of the Cresco & Greentown Telephone Co., Canadensis, Pa.

August 16: Hearing at Washington in the matter of the application of the Mountain States Telephone & Telegraph Co. for authority to acquire the properties of the Miles City-Broadus Telephone Co., owning property consisting of a half-pole line used for toll purposes, carrying an iron metallic circuit approximately of 90 miles extending from the exchange of the Mountain States Telephone & Telegraph Co. at Miles City, Mont., to the town of Broadus, and a branch line approximately 15 miles in length extending from Volberg to Stacey. The Mountain States company agrees to purchase the properties for $5,500.

August 16: Hearing at Washington in the matter of the application of the New York Telephone Co. for authority to acquire the properties of Our Own Telephone Co., operating a system in portions of Sullivan and portions of Cicero and Manlius, N. Y., serving approximately 450 stations.

August 16: Hearing at Washington before Examiner Davis in the matter of the application of the New York Telephone Co. for authority to acquire control of the Catskill Mountain Telephone Co., operating systems in portions of Hunter, Jewett, Lexington, Pratsville, Ashland, Windham, Cairo, Catskill, Greenville, Durham, Conesville, Broome, Rensselaerville and Westerloo, N. Y.

August 16: Hearing at Washington in the matter of the application of the Pacific Telephone & Telegraph Co. for authority to acquire the properties of J. R. Fort, doing business as the Coast Telephone Co. in Cambria, Cayucus and Morro Bay, Cal.

August 16: Hearing at Washington before Examiner Davis in the matter of the application of the Michigan Bell Telephone Co. for authority to acquire the properties of the Leelanau Mutual Telephone Co., Northport, Mich.

ALABAMA.

July 23: Hearing held on petition of W. L. Fain and S. L. Brewer for approval of the sale to them of the Wadley and Wedowee Telephone companies.

ILLINOIS.

September 4: Hearing in the matter of the application of the Illinois Bell Telephone Co. for permission to raise its rates in Decatur.

INDIANA.

July 30: Petition filed by Northern Indiana Telephone Co., Carl H. Mote, president, requesting the commission to establish uniform toll rates and regulations between companies in northern Indiana.

August 2: LaPorte County Telephone Co. denied rehearing on commission order of July 26. This order refused company's

KEARNEY
Non-Chaffing
Cable Ring Saddles
5 Sizes
Main Office ST. LOUIS, MO.

ACCOUNTING
HERDRICH AND BOGGS
Certified Public Accountants
Specializing on Public Utilities
901-7 Continental Bank Bldg.
Indianapolis, Indiana

Universal Insulators
will support your drop wires to your entire satisfaction and at a minimum cost. Are you a user? Samples free on request.
Universal Specialty Co.
711 Poplar Street
Terre Haute, Ind.

GUSTAV HIRSCH
Consulting Engineer
In all branches of Telephone Engineering, Rate Cases, Appraisals, Financial Investigations, Inspections and Reports
COLUMBUS - OHIO

KEARNEY
Solderless
Service
Connectors
For Telephone Service Taps
Main Office - - ST. LOUIS, MO.

CONSULTING
Telephone Engineer
GARRISON BABCOCK
1107 White Building
SEATTLE - WASHINGTON

NAUGLE POLES
Northern and Western Cedar
Butt-treated or Plain
NAUGLE POLE & TIE CO.
59 East Madison St., Chicago

The advertisers on this page will render you prompt, efficient service

request to increase rates temporarily to raise funds for rehabilitating its property following damage by storm of May 2.

August 2: Order issued granting a slight increase in rates to the New Salem Telephone Co. The order stated that the increased rate was not sufficient to guarantee a fair return on the company's investment, but that it was all that had been asked.

KANSAS.

July 24: Plains Telephone Co. authorized to take over exchange at Kismet. Business rates increased from $1.50 to $2.50 a month.

July 24: Trego County Cooperative Telephone Co. granted certificates to operate at Wakeeney.

July 25: Application filed by United Telephone Co. asking permission to issue $352,400 in common stock.

July 27: Complaint dismissed of Montgomery County Farmers Mutual Telephone Co. against the ordinance of the city of Tyro relating to the construction, maintenance and operation of telephone and telegraph lines within the city of Tyro. Case dismissed on request of complainants.

July 30: Application filed by certain merchants of Bogue and now subscribers of the Farmers Telephone Exchange of Bogue for permission to have service furnished them by the Central Kansas Telephone Co. through its exchange at Hill City.

July 30: Complaint filed by citizens of Parker vs. the Kansas Telephone Co.

July 31: Complaint filed by R. E. McGinnis vs. the Kansas Telephone Co.

MICHIGAN.

July 25: The purchase by the Tri-County Telephone Co. of South Haven of eight companies, approved.

MISSOURI.

July 22: Application granted of Dora Roy, doing business as the Wentworth Telephone Exchange, to sell and J. W. Roy to purchase certain property and franchise in Wentworth.

July 23: In the matter of the application of the Middle States Utilities Co. of Mo. for authority to file amended rate schedules and file collection rules for Gilman City, Lawson and Cainsville, respectively, commission ordered engineering department to make inventory and appraisal of properties.

July 23: In the matter of the application of the Middle States Utilities Co. for authority to file amended rate schedule for Mercer, commission ordered engineering department to make inventory and appraisal of the property.

July 24: Application granted of Haston Allen to sell and Ozark Central Telephone Co. to buy exchanges at Thayer, Alton and Thomasville and toll lines connecting them.

July 27: Complaint filed by J. K. Franks vs. Citizen's Public Service Co., charging unsatisfactory service at Metz.

July 29: Application filed by Central West Missouri Telephone Co. for permission to file new schedule of rates at Norwood.

July 31: Application granted of Home Telephone Co. for permission to sell stock to pay for telephone plant purchased and to make improvements and additions thereto. Company authorized to acquire and operate property formerly owned by Harrison County Mutual Telephone Co, which was sold at sheriff's sale January 25, 1929, to J. C. Ray of Bethany; also to issue and sell $10,000 in principal amount of its common stock.

July 29: Application granted of John F. Blize to sell and the Scotia Telephone Co. to buy lines connecting with the exchange at Ulman and for a certificate of public convenience and necessity to the Scotia Telephone Co. to operate same.

July 29: Youngblood Telephone Co. of Ozark authorized to maintain the exchange it recently acquired to Ozark.

WISCONSIN.

July 27: State Long Distance Telephone Co. authorized to place in effect an increased schedule of rates for multi-party rural and seasonal service.

"STEWART" TEST SET

The "STEWART" Test Set tells which way and how far trouble is from you without cutting the line for test. It is equipped with detector coil as well as shunt method. Has transmitter circuit, making complete telephone. Thousands in use. Sent on trial. Price $32.00.

Send in your old Set, we will make it work like new at a fair price.

Also, Cable Testers, Test Cabinets and Detecto-Meters.

STEWART BROTHERS, Ottawa, Ill.

We would be pleased to quote you on

Poles, Poleline Hardware, Cross Arms, Iron and Copper Wire and Cables, Batteries, Insulators, Etc.

Telephone Construction & Distributing Co.
Petersburg, Indiana

Creosoted Wood Conduit

Railroad Ties, Bridge Timbers, Piles, Poles, Paving Blocks and Lumber—Manufacturers of Cross Arms, Signal Trunking and Wyckoff Conduit for Underground Wires.

The Wyckoff Pipe & Creosoting Company
Established 1851
OFFICE: 522 5th Ave., N. Y. WORKS: Portsmouth, Va.

ZETKA SPECIAL VACUUM TUBES

For the rigid requirements of Telephone Repeaters and Amplifiers, Special characteristics, together with longer life, insure a minimum "replacement" problem.

Grid, Plate and Filament are designed to produce *maximum* efficiency under actual operating conditions.

Zetka Special Tubes *cost* more—and are *worth* more.

Send us *your* specifications and operating conditions. We will be glad to cooperate with you to increase your efficiency.

Radio Utilities Corporation

67-73 Winthrop Street
Newark, New Jersey

EVER-PROTECT CABLE COMPOUND

EFFECTIVE *in maintaining your underground and aerial cable in perfect condition*

NATIONAL CABLE COMPOUND CO.
MITCHELL *INC.* INDIANA

OPPORTUNITIES!

Rates 10 cents per word, payable in advance. Minimum charge $2.00 for 20 words or less.

"REBUILT" TELEPHONE APPARATUS

and exchange equipment saves you 30 to 50 per cent—quality and efficiency guaranteed.

EVERYTHING YOU NEED

for the installation and operation of a complete exchange—Magneto or Central Energy.

TWENTY YEARS' SUCCESSFUL OPERATION

of our "Rebuilt" Equipment Department puts it past the experimental stage. Ask for our Free No. 78 Bargain Bulletin.

ADDRESS

"Rebuilt" Equipment Department

Premier Electric Company

Chicago, Ill.

"REBUILT" when connected with PREMIER means something.

RECONSTRUCTED EQUIPMENT

Kellogg No. 28 3-bar 1000 or 1600 ohm Bdg. desk sets @ $10.00—4-bar $10.75—5-bar (all with New Cabinet inside connection signal sets) @...	$11.50
Kellogg No. 742 Common battery steel hotel sets with straight line or 16-33-50 and 66 cycle ringers @....	6.75
Swedish Am. 5-bar 1600 ohm Bdg. compacts with Kellogg Transmitters @..	8.25
Kellogg No. 101 or 301 combine line drops and jacks, per strip of 5 @..	7.50
Gray 3-slot wall or desk type pay stations @	5.75
Dean No. 240 type 3-bar 1000 ohm Bdg. compacts with Kellogg Transmitter @	6.75
Dean No. 240 type 4-bar 1000 or 1600 ohm compacts, Kellogg Transmitters, @	7.50
Am. Elec. No. 36 4-bar 1000 ohm Bdg. compacts with Kellogg Transmitters @	6.50
Stromberg No. 599 type 4-bar 1000 or 1600 ohm Bdg. compacts with Kellogg or Stromberg transmitters @.....	6.90

Write for Our Bulletin

REBUILT ELECTRIC EQUIPMENT CO. Not Inc.
1940 W. 21st St., Chicago

WANTED

FOR TRADE—Income property in Los Angeles Harbor, near Long Beach; 7% guaranteed on investment. Will trade for telephone plant of 250 to 400 stations in Middle West. Address 7534, care of TELEPHONY.

HAVE YOU ANY OLD TELEPHONE EQUIPMENT TO BUY OR SELL?

Then try the "Opportunities" page in TELEPHONY for it will give you quick and pleasing results, as the following letter from the Manteca Telephone Co., Manteca, Calif., testifies:

"Enclosed please find check in payment of invoice for classified advertisement. Had fine results from the advertisement as is usual in good old TELEPHONY."

We receive many similar letters every day.

WHY DON'T YOU GIVE IT A TRIAL?

IF YOU ARE IN NEED OF THE FOLLOWING

Kellogg Desk Stands—Magneto or local battery, with or without induction coils or retard coils.

Kellogg Steel Hotel Sets either retard or induction coils, straight line or harmonic ringers.

Kellogg No. 259 Steel Signal Boxes, with or without induction coils, straight line or harmonic ringers.

Kellogg No. 75 Steel Signal Boxes, straight line ringers.

Kellogg No. 404 Steel Signal Boxes, straight line ringers.

Kellogg No. 408 Wood Signal Boxes, straight line or harmonic ringers.

We Have Them. Write for prices.

Electrical Instrument Repair Co.
1721 West Adams St. Chicago, Ill.

Stromberg-Carlson Common Battery Desk Sets

988 or 986 type desk stands with steel bell boxes, code No. 1132.

Straight Line $5.50

Harmonic Ringers 6.00

Buckeye Telephone & Supply Co.

1432 S. Parsons Ave.
COLUMBUS, OHIO

FOR SALE

TWO CONDUCTOR new black silk desk stand cords, 25c; W. E. No. 47A fuses, $6.00 per 100; W. E. No. 14 terminal, 16 pair less stubs @ $3.00; No. 17 parallel bronze drop wire, $6.50 per 1000 feet; Stromberg-Carlson P. B. X. jacks, keys and relays, very cheap. Prices on request.

The TELEPHONE REPAIR SHOP
6966 Ravenswood Ave., Chicago.

FOR SALE—1 2-position Toll and 4-position Local Kellogg
C. B. Associated Line Lamp Switchboard equipped with
20 Toll Universal Cord Circuits
60 Local Universal Cord Circuits, 2 and 4 party ringing
30 Toll Line Circuits—Drops and Jacks
520 Local Line Circuit, complete with line and cut off relays.

1 30-Ampere A. T. Type Rectifier
1 Power Board
1 Chief Operator's Desk
1 Wire Chief's Desk
All in good condition.

For further information and prices address Mr. F. M. Strasser, % Lincoln. T. & T. Co., 14th & M Sts., Lincoln, Neb.

POSITIONS WANTED

POSITION WANTED—By experienced telephone man as switchboard man, wire chief, manager. Best references; real live telephone man. Address 7541, care of TELEPHONY.

POSITION WANTED—As manager or combination manager and troubleman. Nineteen years' experience from ground up. No matter what shape your exchange is in. Reference. Address 7544, care of TELEPHONY.

WANTED POSITION—As manager of telephone plant in central or northern Wisconsin. Have 20 years' experience, and can give references. Address 7547, care of TELEPHONY.

WANTED TO BUY

WANT TO BUY—Exchange from one hundred fifty to three hundred subscribers in Iowa or Missouri. Must be reasonable. Address 7548, care of TELEPHONY.

TO OBTAIN the *Right Man* for your requirements, an "Opportunity's" advertisement will place him in touch with you.